THE IRON AGE

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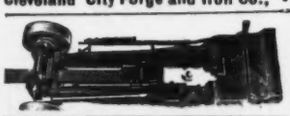

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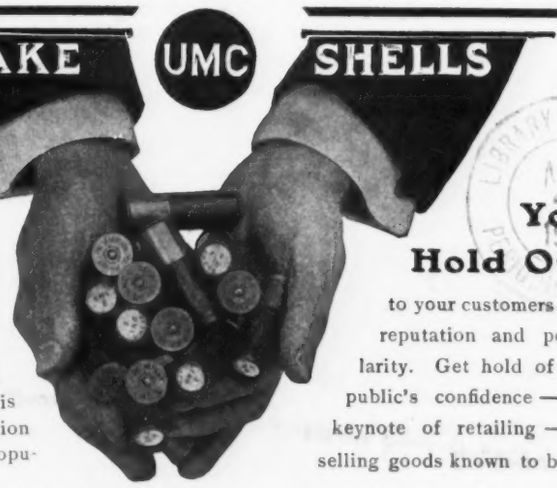

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THE IRON AGE

New York, Thursday, March 19, 1908.

A Huge Tod Rolling Mill Engine.

An engine of unusual size and design has recently been installed at the Ohio Works of the Carnegie Steel Company by the William Tod Company, Youngstown, Ohio. The engine, shown in Fig. 1, is of the tandem compound Corliss type, having long range cutoff gear, and its cylinders are 52 and 90 in. in diameter by 60 in. stroke. It drives the new three-high blooming mill and replaces a 45 x 72 in. twin cylinder reversing engine built by the same maker several years ago.

A special feature of the design is the direct attachment of both the high pressure and low pressure cylinders to the bed plate. The high pressure cylinder is secured by studs to the flange of the bed plate, while heavy forged steel tie bolts 13 in. in diameter extend from lugs on the bed plate to sockets in the low pressure cylinder head. The tie bolts pass alongside of the high pressure cylinder, but are entirely free from it. By this construction the expansion and contraction of each cylinder is taken care of separately, and in operation no perceptible motion of either cylinder occurs. The sole plate under the cylinders is of the heaviest construction, although it simply maintains the alignment of the machine, both cylinders being free to slide upon it.

The main bearing, which is 30 in. in diameter by 58 in. long, is cast in one with the guide barrel, and the finished bed plate weighs 95 tons. Its massive proportions are indicated in Fig. 3, which is from a photograph taken while the casting was being handled on a planer during the machining of the ways for the bearing boxes. The back bearing is similar in design to the main bearing, and is secured to the foundation by numerous bolts, and the illustration of the former, Fig. 2, shows clearly the construction of these bearings. Each is provided with four shells, rigidly locked in place by the cap, which is reinforced by two heavy horizontal bolts. A liberal channel around the edge of all main castings entirely prevents oil from reaching the foundation.

The pistons are both of steel and of the conical or umbrella form, the use of which has been the standard practice of the William Tod Company for several years. Pistons of this type of large diameters have been in successful operation for some years, and have proved entirely satisfactory. The high pressure piston rod is 11 in. in diameter and is solid, and the low pressure piston rod is 15 in. in diameter and is hollow. Both pistons are carried free from the cylinders, the rods being cambered and supported on sliding heads. The construction is such that easy access may be had to both cylinders without disturbing any tie pieces or heavy parts of the engine. The low pressure cylinder is provided with a manhole in the backhead.

The crosshead is of cast steel, of light construction, and has adjustable shoes. Its bearing surface is 30 x 60 in. The connecting rod is of the marine type, with babbitt directly in the rod at the crank end, and a solid end with bronze boxes at the crosshead end. The crank shaft is 30 in. in diameter in the bearings and 36 in. in diameter through the flywheel, and is a hollow steel forging. The flywheel is of extra heavy construction. The rim is in two parts and was cast with the arms. The latter are separated at the center to eliminate shrinkage strains, are of H section, giving extreme rigidity, and are secured in a cast steel hub. The complete wheel weighs 250,000 lb., and is 25 ft. in diameter.

Owing to the extremely heavy and variable service which this engine has to perform, a special type of cutoff gear was required. The power required for certain passes of the ingot is far in excess of the power which the steam cylinders can develop, and the flywheel was designed to supply the deficiency in power; the engine of necessity slows down during the rolling periods, but recovers its speed in the intervals between passes. The engine must therefore regulate quickly and be free from any tendency to race. As the engine will develop 8000 hp. at its rated speed, and as this will bring the wheel back to full speed in about two revolutions, the governor must have great stability to prevent racing.

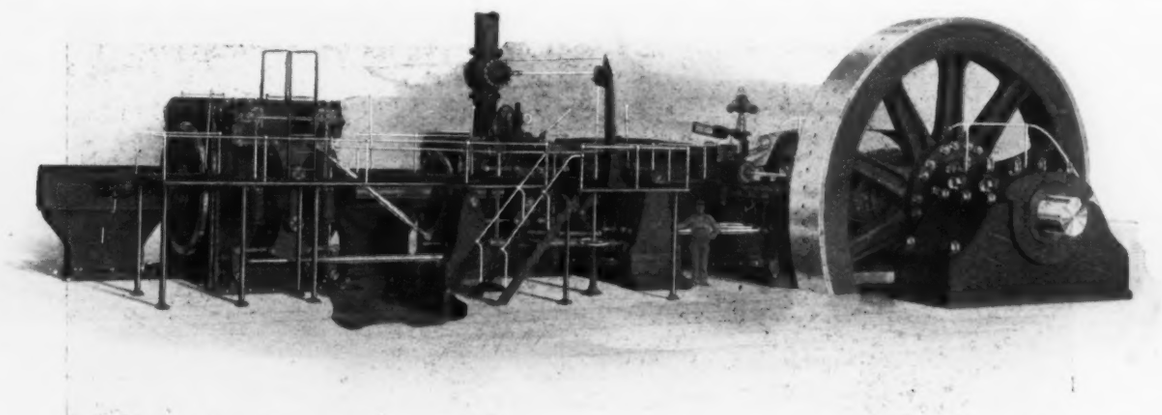


Fig. 1.—An 8000-Hp. Tandem Compound Rolling Mill Engine Built by the William Tod Company, Youngstown, Ohio, for the Ohio Works of the Carnegie Steel Company.

The range of cutoff is from nothing to full stroke, and as the usual expedient of giving the steam valves negative lap was not permissible on account of the danger of the engine running away in case of derangement of the dash pots, a floating trip gear was adopted. The governor can release the steam valves at any point of the piston travel, but the steam valves are positively closed by the wrist plate at the end of the piston stroke, so that in no event can the boiler pressure pass directly to the low pressure cylinder, as is the case with the usual double eccentric type of gear. The steam valves for both the high pressure and low pressure cylinders are driven from a single eccentric, while the exhaust valves on each cylinder have a separate eccentric, thus departing from usual practice and providing for the separate adjustment of compression and release in each cylinder. Owing to this arrangement perfect valve setting has been attained in both cylinders, as the indicator cards have demonstrated. The valve gear rockers are inverted from their usual position and hang downward. The carrier rods, therefore, tend to swing pendulum fashion, which is claimed to reduce wear and tear as compared with the usual ar-

rangement. A hand operated piston valve is provided in a convenient position, by means of which the engine may be turned by hand in either direction.

As may be seen from Fig. 1, the enormous size of the engine demands a special arrangement of operating platforms around the valve gear. This platform is 7 ft. above the floor line, leaving ample room underneath for access to the lower valve gear. This is believed to be the largest tandem compound engine ever built, and is the only engine regularly transmitting over 8000 hp. through a single crank pin. An idea of the immense size of the engine may be had from the following dimensions: Total length, 71 ft.; hight of low pressure cylinder above foundations, 13 ft.; hight of center of engine above foundations, 6 ft. 11 in.

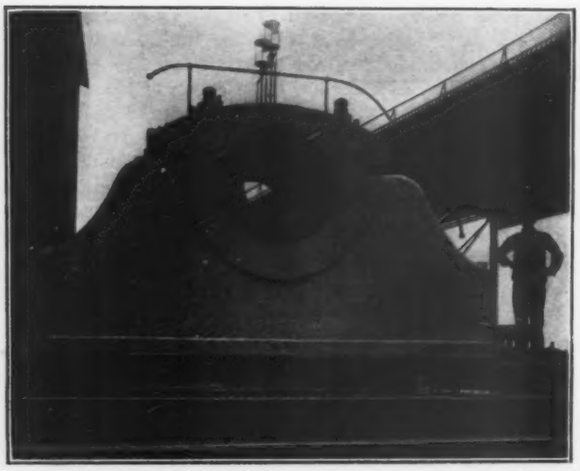


Fig. 2.—The Outboard Bearing on a Car Ready to Be Shipped.

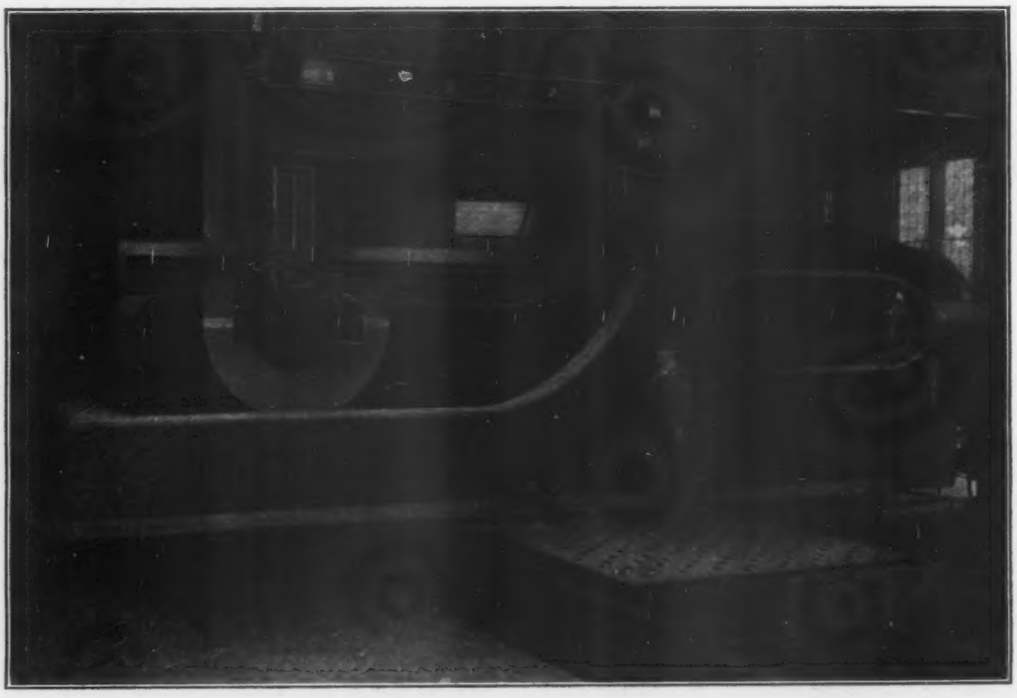


Fig. 3.—The Main Bed and Largest Single Casting (Weight 95 Tons) as It Was Handled on a Big Planer.

Smokeless Combustion.—To effect the smokeless burning of bituminous slack, the Chester B. Albree Iron Works Company, Pittsburgh, Pa., simultaneously fires its boiler furnaces with a small amount of natural gas. Plain stationary grates are used, and the gas is introduced through five small jets in the side walls of the furnace, about a foot above the level of the grate. Originally the two equipments were installed for alternative use of either independently, so that one might be a reserve for the other. Now, however, they are generally used in combination, since it has been found that the necessary excess of oxygen and heat are thus supplied to produce smokeless combustion of the soft coal when more than the ordinary amount of air is admitted under and over the grates. A somewhat remarkable fact is that a better economy results than when either fuel is used alone. The coal costs abopt $1 a ton delivered at the plant and the gas 10 cents per 1000 cu. ft.

The New England Foundrymen's Association.

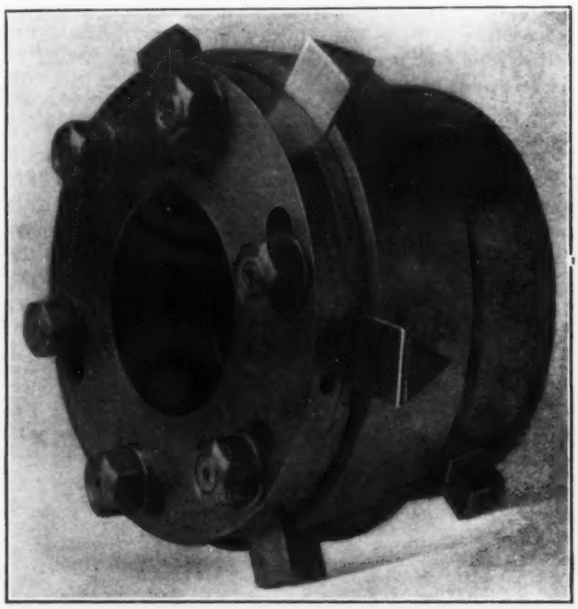
At the monthly meeting of the New England Foundrymen's Association at the Exchange Club, Boston, March 11, the Committee on Shortages reported through J. L. Anthony that the chairman had called a meeting of the general committee, representing the various interests of pig iron and coke shippers and consumers, to be held at the Bellevue-Stratford Hotel, Philadelphia, March 18, when the questions discussed at the recent conference will be considered, with the idea of formulating a plan of relief. The selection of J. L. Anthony, Weir Stove Company, Taunton, and B. M. Shaw, Walker-Pratt Mfg. Company, Boston, to represent the New England Association was confirmed.

A communication was received from the New England Stove Manufacturers' Association asking the cooperation of the Foundrymen's Association in bringing about the adoption of a universal pig iron contract that would protect the interests of the buyer and be acceptable to the seller as well. In the discussion that followed members stated that under present conditions the pig iron people insist on having things their own way and that the time has come when consumers should get together and have the contract amended to give them better protection. Messrs. Anthony and Shaw were appointed a committee to act in the matter in conjunction with the Stove Manufacturers' Association. The Debevoise-Anderson Company, New York, was elected to membership. President Henry F. Arnold was in the chair.

After dinner George N. Jeppson, Norton Company, Worcester, Mass., gave a highly instructive talk on grinding wheels, describing alundum and its manufacture, the advantages of grinding wheels, the machines with which they are used, their mounting and safety devices and their selection. Announcement was made that the next meeting would be at Boston, April 11, and would be addressed by T. E. Byrnes, vice-president of the New York, New Haven & Hartford Railroad.

The Melvin Boring Head.

The 10-in. shell type boring head illustrated is the latest pattern of multiple tool boring head made by Melvin & Hamaker, Meadville, Pa. Like its predecessors, it uses cutters which are of equilateral triangular section inserted in the body of the head in milled seats so formed



The New Multiple Tool Boring Head Made by Melvin & Hamaker, Meadville, Pa.

as to give the proper clearance angle at the cutting edges and end clearance allowed by inclining the slots forward from true radial position. The cutters are reversible from one cutting edge to another and are also reversible end for end, so that six cutting edges are available. When finally all cutting edges are dulled the cutters can be ground on the sides and are again ready for use. The head is made of steel and the cutters of high speed steel.

In the type illustrated the body is counterbored and has an internal thread. A ratchet shaped cam fits into this counterbore, and has a flange on the outside which serves as the main clamping collar. The end of the body has V-shaped seats to receive the cutters, and an intermediate steel clamping ring is milled at corresponding angles with the V seats in the head proper. This ring is bound against the cutters by screwing up the nuts on the bolts which extend through the slots in the flange of the cam ring. There is a wrench furnished for tightening this clamping collar. The cutters are first brought to their seats on the ring having cam faces; the latter is adjusted to give the correct cutting diameter, and the clamping collar is then fastened. This engages all of the cutters and locks them firmly in position.

The head has an adjustment from ⅜ to 1 in., depending on its size. The cam controlling the adjustment is revolved by inserting a rod in a hole in the periphery of the flange. A definite amount of adjustment is allowed by the slots in the cam ring flange or clamping ring, and graduations enable the operator to obtain the required size without calipering. The intermediate collar, which lies between the clamping ring and the cutters, has rubber compression rings between the screws and ring. These maintain a pressure on the cutters when the front collar is loosened, so that the cutters are prevented from falling out, chips are prevented from accumulating between the cutters and the seat, and the operator is permitted to make an adjustment without any likelihood of the cutter not being seated on the adjusting seat.

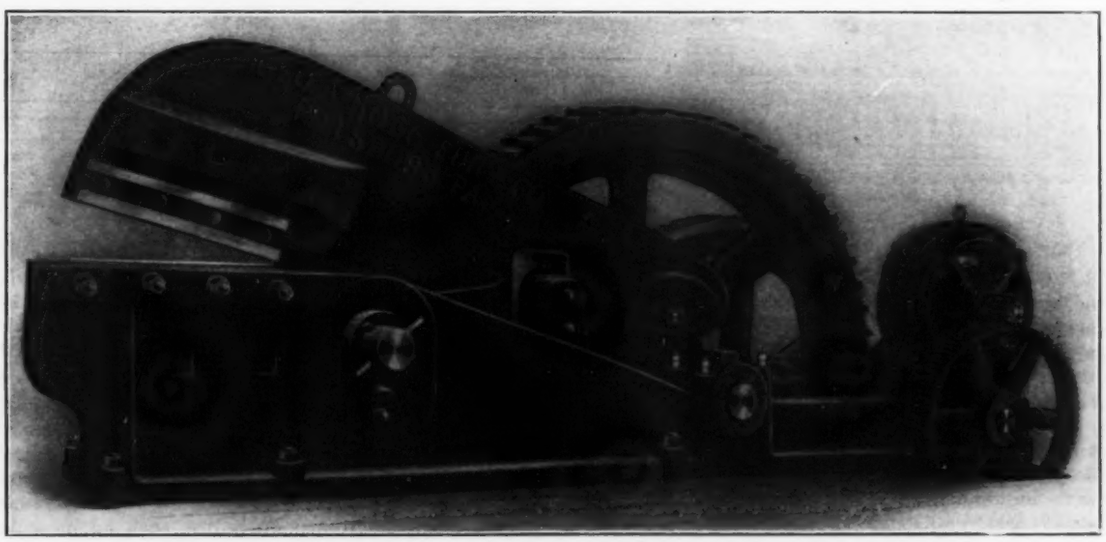
The shell type of cutter head is made in sizes of from 5 to 18 in. in diameter, and the machine type in sizes from 2 to 16½ in.

A Hogg High Knife Scrap Shear.

A No. 7½ high knife scrap shear built by the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., for the Joseph Joseph & Bros. Company, Chicago Heights, Ill., is shown in the accompanying illustration. This shear is capable of cutting cold soft steel up to 5 x 5 in. in section. It is of the high knife type, pitman driven, and is especially designed for shearing miscellaneous scrap and old pipe. A pipe crushing attachment has been provided which can be attached to the front of the shear and removed when not in use, allowing pipe up to 16 in. in diameter to be crushed.

The shear weighs approximately 90,000 lb., has knives 30 in. long and is driven by a Bullock 60-hp. three-phase induction motor. The main pin of the shear is a steel forging 10 in. in diameter. The main gear is of heavy pitch and is driven by a steel pinion. The gears connecting the motor are machine cut, insuring smooth running.

The shear, being of the high knife type, is especially adapted to shearing old boiler plate and like material, and in its design it has been the aim to increase the metal at the points of greatest strain to prevent the breakages that usually occur in shears of this type.



The No. 7½ High Knife Scrap Shear Built by the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, Pa.

Judge Lewis Shepard, Judge D. L. Snodgrass and Dr. S. D. Spence of Chattanooga, Tenn., have been granted a patent for an electric furnace. The process, it is stated, can be used for a small or large furnace and melt from 10 lb. of any kind of metal or ore to 100 tons.

The Compression of Semiliquid Steel Ingots.*

BY N. LILIENBERG, PHILADELPHIA.

The production of sound steel continues to be one of the most important questions of the present time. Previous efforts in that direction have mostly concerned special high grade steel, but of late even makers of structural steel and rails are looking for some suitable means of making ingots solid and of proper structure as well a· of lessening the crop ends and segregation. In regard to rails, it has been conclusively demonstrated by experts (especially by the able engineer of the Philadelphia & Reading Railroad) that most of the failures in actual use, sometimes causing serious disasters, are due not to wrong chemical composition or to faulty heat treatment, but to treacherous cavities in the steel ingots, compressed by the rolling but not welded. High authorities therefore now recommend that even rail steel be compressed before the ingots are solid. It is well known to be quite possible by any steel process to make sound steel without blowholes, the whole shrinkage then being taken up by the pipe which is correspondingly larger when other cavities are absent. In that case compression shows to greatest advantage, but even steel developing gases after being poured in the molds can be compressed solid. It is only steel with surface blowholes which cannot be improved by compression.

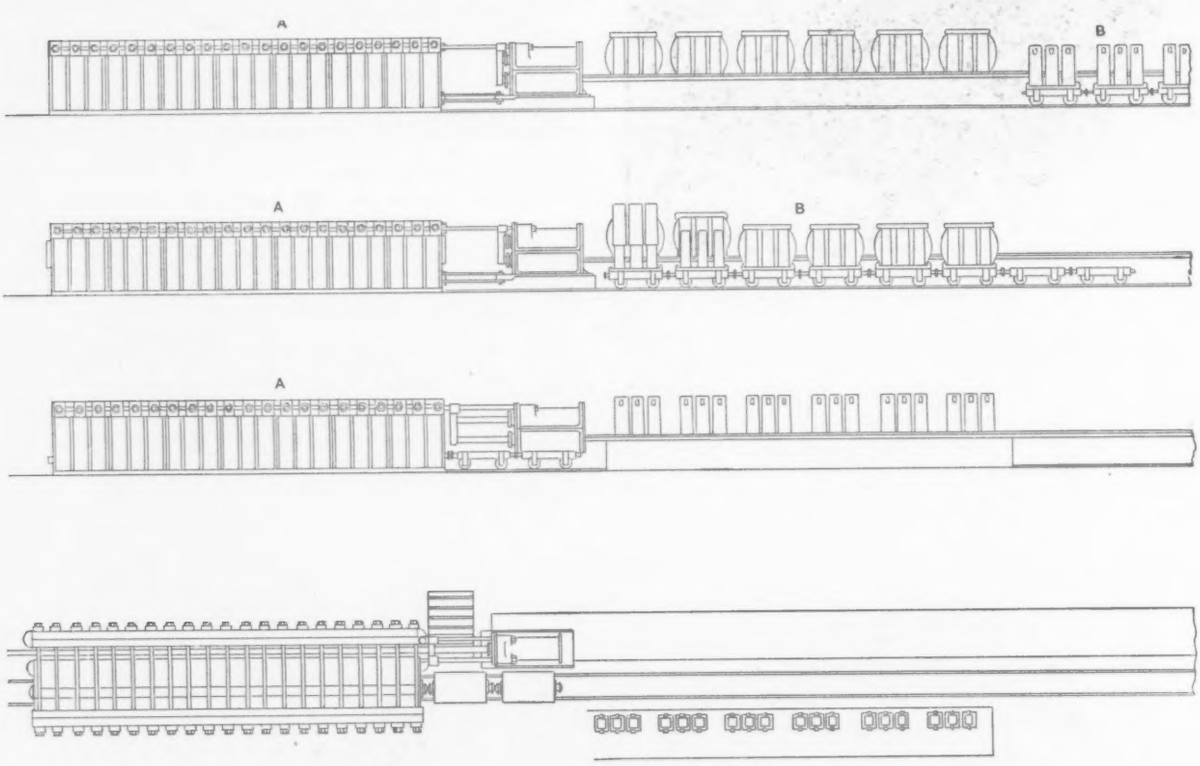


Fig. 1.—Plan and Elevation of Continuous Press for Steel Ingots Cast on Cars.

The formation of pipe in steel ingots has recently been studied to considerable extent. Mr. Stead, in England, has published very valuable observations, but especially has Prof. H. M. Howe gone deep into this matter. He shows that the formation of pipe is very complicated, because steel increases in volume at solidification and the sinking of the liquid steel then takes place at the different periods in accordance with the difference between swelling and shrinking of the interior and exterior. By a series of experiments with melted stearic acid he has also shown the influence of the temperature of the steel and of rapid and slow cooling on the formation of pipe. I do not intend to discuss these matters here, as my object is to deal only with practical manipulation for improving steel. It is enough for practical work to know that pipe will form more or less in every steel ingot, no matter in what way it is cast. The advice to cast steel at certain desirable temperature is of course difficult to follow, because the melted steel changes temperature between the casting of the first and the last ingots.

Effects of Cooling and Heating.

When steel has filled the mold there is instantly a thick crust of solid steel formed at the bottom and a thin crust on the sides inclosing a quantity of liquid steel. If the steel is allowed to cool undisturbed, the liquid mass inside gradually settles as solid steel in the inside of the shell, and as the quantity is not sufficient, owing to the contraction, a space is left extending from the top irregularly downward. If the ingot after being entirely solid and red hot is allowed to cool slowly without being worked, large crystals are formed, especially around the pipe, and there is danger that the internal strain may separate them and form fissures which afterward may develop into large cracks.

This danger is again repeated when a cold unworked ingot is put into a heating furnace. An ingot allowed to cool slowly and undisturbed is made up of a surface of interlaced crystals and an interior of larger crystals of weaker cohesion. When, therefore, such an ingot, especially if it is of large size, is laid into a reheating surface it is very difficult to prevent the surface from expanding more rapidly than the interior, which, therefore, is liable to break, sometimes with a perceptible sound. The cracks between the interior crystals are of course not visible, and there are cases where these have been enlarged by forging into considerable cavities, discovered when the finished article is machined, or, still worse, not discovered until a break occurs.

It has been fully demonstrated that the steel crystals are larger in proportion to the length of time for solidification. Thereafter it depends on whether the substance binding the crystals together is strong enough to resist the internal strains during continued cooling.

* From a paper read before the Mining and Metallurgical Section of the Franklin Institute and printed in the Journal of the Institute for February.

The whole steel industry may be characterized as "the struggle against crystals," and I therefore beg to emphasize the abovesaid as being of equal importance with the obviation of pipe.

Segregation, depending on the floating upward of the alloys of iron with lighter substances, can never be completely avoided, but only lessened under special circumstances. These have been completely investigated by scientists, and it is not within the scope of the present paper to make a review of this matter. For practical purposes it is sufficient to remember that the longer the steel is kept liquid the greater opportunity is given for this separation to take place.

How to Prevent Defects in Ingots.

The defects to be overcome in steel ingots can be summed up as follows: Coarse crystalline structure in the interior; full sized pipe in sound steel; partial pipe and blowholes in steel where chemical action between carbon and ferrous oxide takes place in the molds; segregation. A great deal of work and money has been spent on several methods of preventing all this:

1. Aluminum thrown into molds acts on the upper part of the ingot, keeping it more evenly liquid, and hence the diameter, but not the length of the pipe, is lessened. It reduces ferrous oxide, thereby making the steel more quiet. But its action is confined to the upper part, and the lower is apt to have more cavities than otherwise. A larger quantity of aluminum is liable to be distributed in brittle spots all through the steel. The opinions as to the effect of aluminum on segregation seem to be divided.

2. Casting continuous ingots has been tried, but the practice has been largely abandoned. The apparatus is complicated, and as the attachments to the cast ingots have to be removed, it can be used advantageously only for small ingots.

3. Keeping the top uniformly hot by placing a clay lined box on the top of the mold and applying a flame directed downward by blast through a coke fire is in successful operation. The apparatus is complicated, however, and must consume a considerable amount of coke. When the operation stops the remaining liquid steel will continue to sink somewhat before solidification. The action can only extend to a limited depth, and thus cavities are liable to form in the lower pasty part of the steel. As the steel is kept liquid a longer time it is difficult to see how coarse crystals and segregation can be avoided.

4. Casting with the large end upward. The pipe is generally composed of one upper visible cavity ending with a thin bottom, below which another pipe stretches irregularly downward to an undefined length with a point, or with a series of scattered cavities. This is the case in the ordinary tapered molds standing on loose bottoms with the emall ends upward. In casting with wide end upward the pipe is generally confined to the upper visible sinking and the long stretched appendix under the bottom is absent, which is so far an advantage. This is now the prevailing method in Sweden. A clay lined box is placed on the top of the wide end of the mold, whereby the pipe is still further lessened. In most cases it does not stretch below the upper wide end of the ingot, which, however, cannot always be entirely relied on. Between the box and the mold the clay lining is so shaped as to create a neck in the steel, which facilitates the subsequent striking off of the head. It is obvious that all casting with the wide end upward tends to increase the formation of coarse crystals, but, on the other hand, the wider end receives more working in subsequent rolling. The method gives good results in Sweden, where high priced steel is produced, and thus the expense can be borne. It consists in handling the molds by turning them upside down to get out the ingots, forming and drying the sink boxes, striking off and remelting the sink heads.

With a view of taking advantage of the shorter pipe

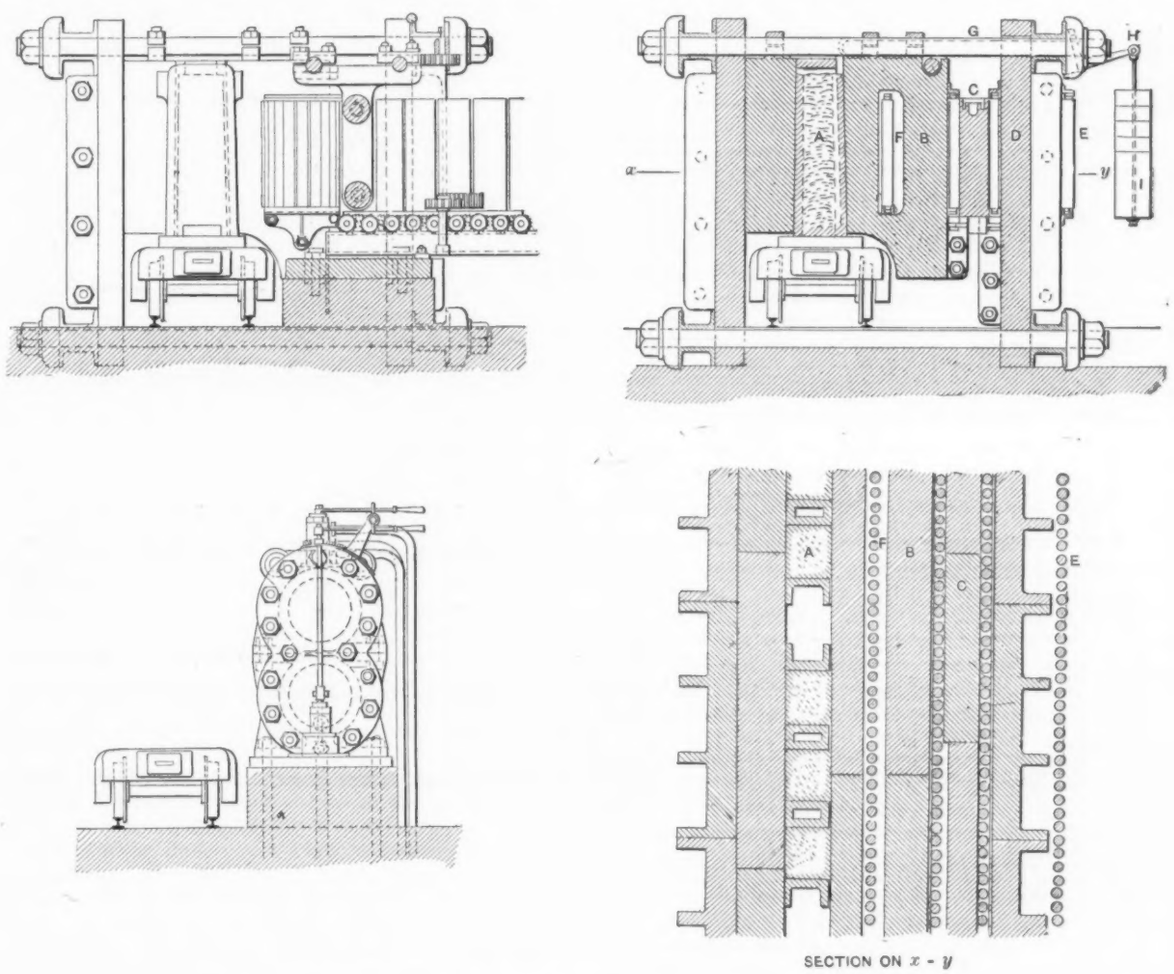


Fig. 2.—End Elevation and Vertical and Horizontal Sections of Pressing Apparatus.

when the wide end is turned upward for ingots so heavy that it would be impracticable to turn the molds upside down after casting the following plan has been suggested. The small end is provided with a loose conical bottom, fitting closely into the recess. After solidification the mold is placed over a hydraulic ram to force bottom and ingot upward out of the mold, which is held down by two upright stationary bars shaped as hooks on the upper end.

5. Centrifugal force acts favorably in driving out blowholes, but of course can not obviate the pipe. Machines for the purpose are, however, too unwieldy to come into general use. The molds would have to be suspended on trunnions in the circumference of a horizontal revolving wheel. I may mention that I have built a machine for making hollow ingots by rotating the circular molds each separately in vertical position.

Some Methods of Compression.

The only way to treat heavy ingots, especially those cast on trucks, is by compression of the semi-liquid steel.

1. Compression from the top has not gained ground. It is impossible to close up the pipe in that way, considering that the solid walls of the upper part of the ingot cannot well be compressed lengthways. Besides the gases are given no opportunity to escape.

2. Compression from the bottom is in successful operation at some works in France and England. The steel is forced upward into a conical mold, which the inventor compares to wire drawing, the top being left open. The bottom of the mold is of course loose and supported by a piston. The casting is done in a place separate from the press, and the ingots and molds are then transported together over a plunger which forces the loose bottom upward together with the steel. The mold has to be strong and is preferably round or octagon, and it must be heavily banded. As the ingot gets firmly stuck another plunger from the top forces it loose from the mold after the operation is finished. This works well and economically when it comes to making a few large ingots, such as for heavy guns, shafting, &c. But if, for instance, a 50-ton

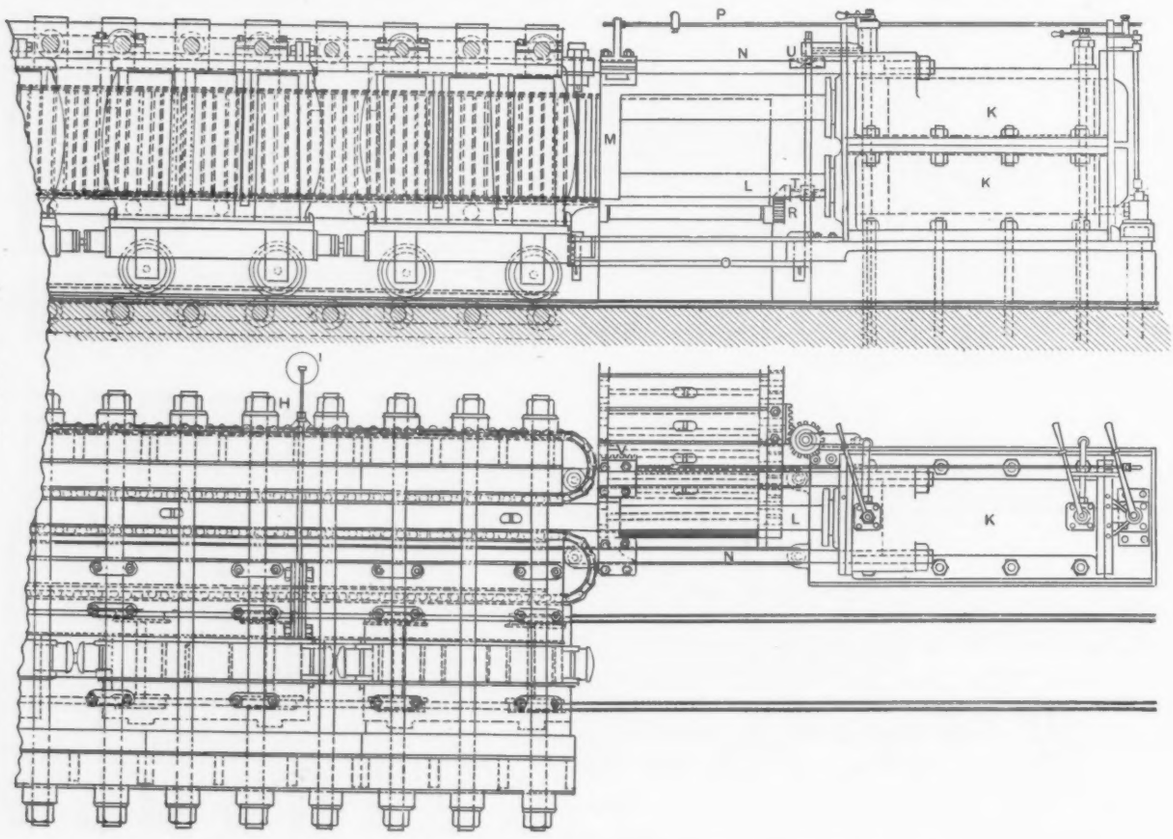


Fig. 3.—Side Elevation and Plan of Pressing Apparatus, with Ingots Under Pressure.

This will improve the structure by making the interior crystals smaller, thereby also lessening the subsequent work on the solid ingot and reducing the segregation. To be effective the compression will have to be timed according to the solidification. It must begin as soon as possible after casting and be continued as long as any liquid steel remains in the interior. If it commences too late the pipe has already been covered with oxide and is thus impossible to completely efface. If finished too early some liquid steel will remain and continue to form pipe. In several compression methods the inventors have lost view of these points. I have stated above that even steel developing gases in the mold can be compressed solid provided these gases do not appear close to the sides. The following changes then take place: The first zone of occluded gases is closed up. Then a new quantity of gases in the liquid interior near the center is set free. If the compression stops there it has only moved the blowholes further inward, but if it is continued as long as liquid steel remains even these secondary blowholes will be closed up. Below is given a review of the principal methods of compression which have been tried or are in practical use:

charge divided among 20 ingots shall be treated in this way, a sufficient number of presses will have to be in operation simultaneously with correspondingly high expenses of installation. The attendance will also be expensive, as it is impossible for one man to watch over the whole row of ingots. The molds will be very expensive and heavy to handle. It would be still more difficult to apply this system for the large quantities of steel cast on trucks.

3. Compression from the side in the molds. The constructions made on this principle must of course have divided molds. Two constructions of this kind are worthy of mention:

(*a*) The casting is done while the halves of the mold are kept together by a hydraulic ram. When the solid skin of the ingot is strong enough the mold is opened sufficiently for introducing a plate as long as the ingot, after which the halves are forced together again by hydraulic pressure. The liquid interior is thereby forced to keep the mold filled to the top until the ingot is solid. Such machines give good results, but can only be used for small sized ingots.

(*b*) For heavier ingots the following construction is

made. The halves of the molds are separated by two bars, cross shaped in section and held together by a hydraulic ram during the casting. As soon as a skin sufficiently thick is formed the cross shaped bars are drawn up, leaving the empty space between the edges of the molds. The hydraulic ram then slowly forces the molds together, thus giving the necessary pressure. This procedure gives very good results and is in continued practical operation. It can also be used for treating ingots standing on trucks. The obstacle in the way of a general adoption of this method are: That the molds of the steel makers will have to be changed from the ordinary solid tapered ones to straight divided; that the handling of the divided molds is expensive; that the walls will have to be made extra strong at the base to stand the swelling of the steel during compression, thereby making the molds heavy and expensive; that the expense is further increased by the edges having to be planed; that it is difficult to avoid a fin where the skin folds in the space between the edges (the fins being planed off by a machine on the cold ingots, a procedure obviously unsuitable for a large and rapid production).

4. Compression from the side on the bare ingots stripped of the molds. In this way many of the above named difficulties are avoided, besides the molds will last longer as not being in contact so long with the hot steel and liable to be pressed out of shape. The first question is whether it is possible to strip the ingots early enough. The time of solidification stands in proportion to the weight and size of the ingot. An 18-in. square ingot weighing about 2½ tons will require about 1 hr. to get solid to the center. The stripping of such ingots usually takes place about 30 min. after casting. Although this is somewhat late, liquid compression can still be done at that time, but it is preferable to reduce this to 15 min. Experience has shown that this can be done at steel works, where the casting and stripping is managed properly. The taper of the molds should, of course, be sufficient, and the inside of them smooth.

Procedure with Stripped Ingots.

The proposed methods of compressed early stripped steel ingots are mainly the three following:

(A) Rolling the ingot in vertical position between four slowly revolving rollers. This would be theoretically the ideal compression, but it is very difficult to carry out for these reasons: The ingots get out of shape between the rollers; they cannot be easily grasped and handled in semiliquid state; the machine is not only complicated, but there will have to be a great number of them, as the ingots cannot be treated one at a time, because some would cool off.

(B) Placing the stripped ingot in a corner and working on it from two sides by hydraulic rams, after which it is allowed to fall through the bottom and be carried away. It would be necessary to have a great number of hydraulic cylinders for compressing all ingots at the same time, which would be very expensive.

(C) Leaving the stripped ingots standing where they are and acting on the whole row simultaneously with a battery of hydraulic rams placed side by side, the whole being surrounded by a sufficiently strong frame. In this way the compression can be prolonged during the whole period of solidification and lifting the semiliquid ingots is avoided.

It therefore seems that this could be used for ingots while standing on trucks. We, however, meet with several great difficulties. The ingots will have to be moved a small distance sideways so as to release them, and in case of casting on wheels to enable the locomotive to pull out the train without delay. This lateral movement should be made by the returning stroke of the hydraulic rams, but such machinery will not be easy to construct for a group of ingots, especially considering that of the mold and trucks must be made free and clear from all constructions in one moment when the train shall be pulled out. [The difficulties of the problem are detailed at some length.]

How the Requirements May Be Met.

Looking over the requirements again we find them standing as follows:

1. The casting should be made without changing the ordinary solid tapered molds, but the ingots should be stripped earlier than usual, which can be done.

2. The stripped ingots should not be removed from their places on the bottom until the compression is finished.

3. In order that the pressure may be continued according to the solidification, all the ingots will have to be pressed simultaneously, but they must be finished at different periods, according to the difference in heat between the preceding and following ingots.

4. This should arrange itself automatically without any special attendance and the work of hauling, &c., should be reduced to a minimum.

5. The installation should be sufficiently simple and not occupy too large space in a steel works.

To all appearance there is only one way to accomplish this: Leaving the early stripped ingots standing inside of a framework, pressing the whole row of them simultaneously by a wall moved forward by driving in wedge blocks. As the construction is patented, I hereby give some details. Figs. 1, 2 and 3 represent the case of a 40-ton charge divided between 18 ingots 18 in. square, 60 in. high, weighing about 2¼ tons each.

In Fig. 1 the first view shows the press A and the ingot train B during casting. The molds can remain the same as they are now, but the bottoms should be made so as to extend whole under each group of molds. As early as practicable after casting the ingots are stripped. For this purpose it is desirable that the taper of the molds as well as their inside condition is such that the stripping can be done by ordinary plunger. For this size of ingot the stripping should be done not later than 15 min. after casting, when a crust is found sufficient to hold the liquid interior. In the second view the train has moved nearer to the press and the stripping of the ingots has begun. Three ingots are placed on each car, although the number is generally two. On each group of ingots has been placed a frame of cast iron, D, filling up the space between the ingots, and the outside plates provided with ridges are inserted between the ingots and flanges on the bottom plate. These frames are simple to make, and can be shoved in sideways. Their placing in position by traveling crane will only take a few minutes. These frames keep the ingots from falling when they stand stripped on the moving cars unsupported by the molds, and they take up the side pressure during the compression.

The frames are left on the ingots until the train has departed from the press and reached the soaking pit, where they are easily taken out at the time of lifting the ingots. The stripped ingots standing on the train are immediately backed up by the locomotive so as to enter the press, as shown in the third view of Fig. 1.

Operation of the Lilienberg Press.

Figs. 2 and 3 show the installation and operation of the machine. On the cross section Fig. 2, the ingot A is shown as caught between the two walls. The movable piece is pressed by the wedge block C being forced in between the stationary wall D and the movable one B. Roller bearings are placed between the wedge blocks and the walls, as otherwise an extravagant expenditure of force would be needed. These are made very simply of solid rolled steel with the ends set off and inserted into links. The link chains turn around half-round surfaces on each end of the press. The returning idle parts of these link chains and roller bearings move the one outside the fixed wall and the other inside a cavity in the movable wall, as shown at E and F, Fig. 2. The links holding the rollers slide between channel irons fixed to the walls. The lower of these contains steel balls on which the links can roll. It should be remembered that the movement will be as slow as about ¾ in. per second, and that therefore these roller bearings do not have many of the inconveniences of ordinary rapid roller bearings. The wear is of course comparatively small, also the inclination to tilt, which in roller bearings is more apparent in conical than in cylindrical rollers. To steady them against tilting the chain can be made to contain plates at a few points having rollers inserted and made like hinges to bend around the ends. These link chains present the advantage over other roller bearings that they can

be inspected during the open passage around the ends, and it is easy during the slow movement to exchange any broken or worn part.

The wedge blocks are in this case 6 ft. long, 3 ft. 9 in. high. The ends stand at right angles to the side gliding against the fixed wall and the opposite side is tapered. As the time of compression is about twice the time of casting, the first cast ingot placed in the front end of the press should be only half pressed through when the last cast ingot at the other end begins to be pressed. With a compression of 3 in. the tapering of the wedge blocks should therefore be 1½ in. on the blocks moving in the press at the same time, that is about ⅛ in. per 6 ft. length. Beginning with a thickness of 12 in., the last end of the blocks should therefore be 15 in. It is easy to make the total slanting surface of the blocks slightly curved, so that the pressure is automatically changed according to the different periods of solidification. The wedge blocks should preferably be made of steel and planed on all sides, but if this should be too expensive some good cast iron chilled on the two long sides can be used. As the blocks are driven out from the press they are taken care of by the traveling crane, returning them in groups to their position. This is the only actual handling during the operation. The blocks stand on rollers ready to be fed in before the hydraulic rams one by one by a simple mechanism. The rollers are connected by cog wheels and by a rack with slanting teeth, which is moved back and forth from two corresponding cog wheels T and U, Fig. 3, fixed on a vertical shaft. The upper of these cog wheels engages in a short rack fixed on the crosshead of the hydraulic piston rods. It is thus apparent that the movement of the pistons feed in the blocks automatically into position for the next forward stroke. The last wedge block is driven forward by blocks with parallel sides leaving a clearance space of 3 in. When all the wedge blocks are driven out the movable wall is thus released and can be moved backward. The release is then effected automatically by drawbars, G, hooked on the top of the movable wall. These bars are connected with levers H on which the weights I hang.

The hydraulic compressor is composed of two cylinders, K, and pistons, L, which in this case have a stroke of 7 ft. The piston rods are 10 in. in diameter, which is somewhat more than is needed for the strength in order to reduce the consumption of water at the returning stroke. The front ends are screwed to a cross head, M, which is guided by sliding on the bolts N, connecting the cylinders with the press. The valves are made as revolving disks, but can just as well be piston valves if this should be preferable. The movements of the valves are automatic by connecting them with a sliding bar, P, provided with lugs which are pushed by the movement of the cross head.

The construction of this machine is not difficult, and it does not contain more movable parts than several appliances in a steel works (for charging, &c.). It is evident that the automatic movements reduce the attendance, and this consists in fact only by the work of one machinist in regulating the hydraulic pressure and looking at the proper movements of all parts. It is the only machine in which all the ingots are finished automatically in order according to their solidification.

For a machine treating 20 tons, or 10 ingots 17 in. square 55 in. high, standing on five cars, the train occupying a length of 32 ft., the estimated cost is $33,159.

Pressing Stripped Ingots in a Casting Pit.

The same principle as previously described is applied to this case, but the construction of the machine has to be different. As the stripped ingots must not be removed the casting pit will have to be contained in the press and sufficient space given for lifting the molds, handling the ingots, changing the bottoms, and getting down into the pit for cleaning. The distance between the movable and the fixed wall will therefore have to be greater than in the previous case, and the movement of the movable wall back and forth will have to be made by special machinery before the pressure with the wedges is applied. [In the concluding portion of the paper details of this special adaptation of the mechanism are given.]

A. B. C. Blowers in New York City.

A census of the more important blower equipments in or about New York City, and particularly in connection with the ventilation of subways and tunnels, shows a rather remarkable number to the credit of the American Blower Company, Detroit, Mich. Shortly after the opening of the New York Subway it was decided to ventilate the station toilets by some positive means. Small volume blowers were adopted, and 60 outfits were furnished by the American Blower Company. Later the Rapid Transit Commission (as it was then) decided upon a plan for ventilating the Subway itself by means of centrifugal exhausters, and for this purpose A B C steel plate exhaust fans were adopted, 25 of which have been installed in special vaults built in the line of the Subway, about midway between stations, from Fulton to Fifty-ninth streets. These exhausters draw the air from the Subway, many thousand cubic feet a minute, causing an equal amount of fresh air to flow in at the stations. This action is augmented by the plunger effect of the trains themselves forcing the air out through the fan vaults, by means of automatic louvres, which allow the air to pass out, but close automatically when the air tends to flow in the opposite direction. Independent of the ventilating equipment a cooling plant was installed at the Brooklyn Bridge station of the Subway, which employs four more large A B C fans.

In the tunnel extending under the East River from the Battery to Brooklyn, connecting the subways of Manhattan and Brooklyn, opened within the last few months, fresh air is supplied by A B C blowers, two of which are installed at each end of the tunnel, supplying air in the directions in which the trains operate. Following closely upon their adoption by the Interborough Rapid Transit Company, the engineers of the Hudson Companies decided upon A B C blowers for the ventilating of the McAdoo or Hudson tunnels, connecting New York and Jersey City, and the architects of the Hudson Terminal Buildings, for the ventilation of these large buildings, which, taken together, will form the largest office building in the world.

Among the tall buildings in New York which are equipped with A B C fans are the Singer, City Investment, Trinity, United States Realty, West Street, Bank of America, Tribune, St. Paul, United States Express and Flatiron buildings. Less conspicuous in point of hight, but quite as well known, are the Macy, Wanamaker, Altman, McCreery and Claflin stores, the New York press and Saks buildings, the Hippodrome, Police Headquarters, Fordham Hospital, the various public baths, and many others.

The Pennsylvania Railroad Company's Rail Specifications.

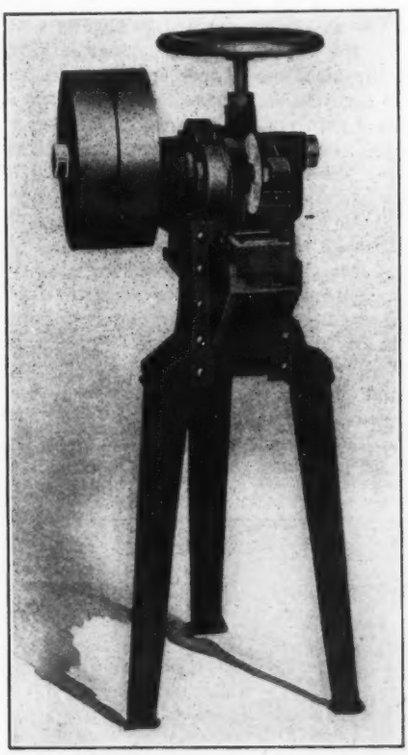
With regard to reports emanating from Pittsburgh to the effect that differences exist between the Pennsylvania Railroad and the United States Steel Corporation over the new steel rail specifications, the following statement has been issued by the Pennsylvania Railroad Company:

"The report in the daily papers to the effect that there is a controversy in progress between the Pennsylvania Railroad and the United States Steel Corporation on the question of the new steel rail specifications is entirely without foundation. The Steel Corporation has not refused to manufacture these rails under the specifications as given, and the Pennsylvania Railroad has not addressed any communication to other lines for the purpose of inviting a discussion of the subject. In view of the fact that the specifications for 1908 were entirely new and represented many distinct innovations in the art, the question of the price to be paid for the rails naturally had to be taken up and agreed upon. Consideration of that subject is now in progress."

It is well known that many other railroads give their orders for rails on the basis of the Pennsylvania's specifications, and for this reason it is natural that care should be used in fixing a price for the new rails, for it will govern not only the Pennsylvania Railroad's order, but other orders as well.

The Victor Pipe Cutting Machine.

A power operated machine for cutting off pipe to lengths, using a gear driven rolling cutter, is offered by the Patterson Tool & Supply Company, Dayton, Ohio. The machine is particularly intended for plumbers and steam and gas fitters and will cut off any kind of pipe from ¼ to 2 in. inside diameter to any lengths. The principle is very much the same as that of the ordinary hand pipe cutter, except that the cutter, instead of being revolved around the pipe, is held stationary and the pipe revolves by the action of the cutter. It is declared that the machine will do the work quickly and cut a perfectly square end, which makes it easy to start a straight



The Victor Power Pipe Cutting Machine Sold by the Patterson Tool & Supply Company, Dayton, Ohio.

thread on the pipe, and that there is scarcely any burr left on the inside of the pipe.

As the illustration shows, the machine is very compact. It occupies a floor space of 18 x 24 in., is 48 in. high and weighs 210 lb. It is constructed to withstand the ordinary usage that such a machine is likely to be put to. The gears are cut from the solid, the cutter spindle is of steel and has bronze bearings, and the lower rolls and bearings upon which the pipe rests are of tool steel and hardened. These rolls are mounted upon the main saddle in a frame which is adjustable vertically, so that the rolls can be caused to press the pipe upward against the cutter by turning the hand wheel at the top.

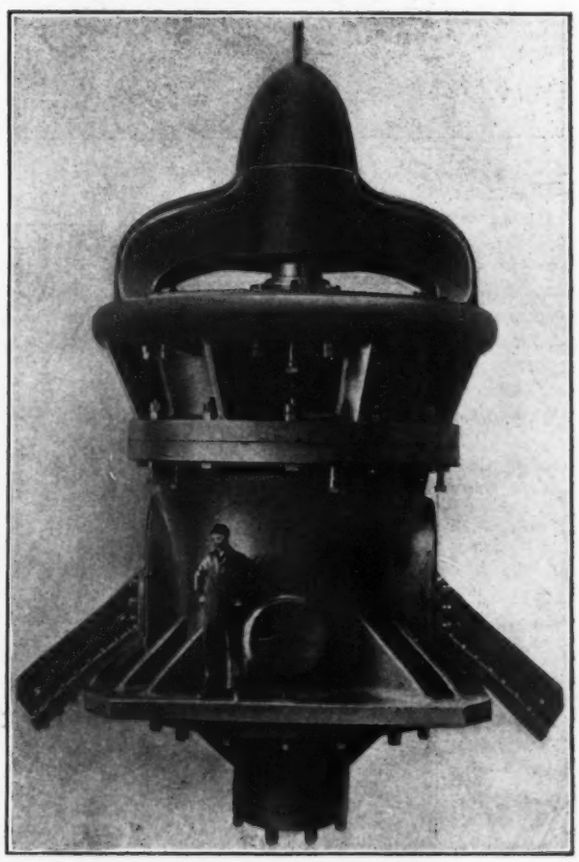
The machine is generally placed at the end of a bench which supports the long end of the pipe when the latter is placed in the machine. If desired the pipe may rest in a V block on the bench to lessen the friction while the pipe is rolling. When in this position the pipe is shifted until the point at which the cut is to be made is directly under the cutter of the machine, and then the hand wheel is turned at the top. This brings the pipe in contact with the cutter and the pipe begins to revolve by power and continues to do so until the pipe is cut off, the feeding being accomplished by the manipulation of the hand wheel, which maintains the pressure between the pipe and the cutter.

It is claimed that the machine when cutting off pipe will not split it even when a short end is cut off. For example, a pipe which is perhaps only ⅜ in. or more too long can be cut to proper length without splitting. Actual tests have shown that it is possible to cut a piece of 2-in. gas pipe 1 in. long in two in 30 sec., and not fracture either part.

A Big Allis-Chalmers Rock Breaker.

One of the direct results of the extended use of crushed stone in concrete construction and other industrial uses is a growing demand for crushers of greater power and capacity. The accompanying illustration shows what is described as one of the two largest rock crushers ever built, and was made at the Reliance Works of the Allis-Chalmers Company, Milwaukee, Wis., for the Casparis Stone Company, Columbus, Ohio. This machine is known as No. 18, Style K, breaker, and stands 25 ft. high, measures 14 ft. across the top shell, and weighs approximately 400,000 lb. It has a minimum feed opening between the crushing surfaces of 36 in., and is supplied with two discharge openings through which the crushed product leaves the machine, differing in this respect from the smaller breakers, which usually have but one opening. This arrangement makes it possible to build the machine lower, thus making it more stable and at the same time obtaining a better angle for the discharge.

This machine is adapted to use only in the largest quarries, where the stone is blasted, taken out with powerful steam shovels, and brought to the crusher in very big



A No. 18, Style K, Breaker Built for the Casparis Stone Company by the Allis-Chalmers Company.

pieces, many of which are too large to be handled by breakers of the greatest capacity heretofore built. It is stated that the machine illustrated is capable of crushing the largest pieces which it is practicable to take from the quarry without the need for any preliminary breaking by sledge hammer or secondary blasting.

In ordinary practice stone is lifted in quarry cars up an incline to a platform at the top of the breaker, and is automatically dumped into the top of the machine. It therefore can be seen that the capacity of this mammoth crusher is practically unlimited, for it is practically impossible to bring stone from the quarry fast enough to choke it. A clear idea of the unusual size of the machine is furnished by the contrasted proportions of the man standing on its base.

Rodd's Improved Automatic Nut Tapper.

The nut tapper shown herewith is designed to thread automatically nuts of all kinds, whether manufactured in large or small quantities. The machine is fully automatic, and claimed to be rapid and economical, the rated capacity of a ¼-in. machine tapping steel nuts being 18,000 in 10 hr., and other sizes in proportion. The machine was designed by Robert T. Rodd, Cuyahoga, Ohio, who for a number of years has been with the Falls Rivet & Machine Company as superintendent of its rivet and bolt works. It is built by that company, and the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., and 428 Williamson Building, Cleveland, Ohio, is the sole selling agent.

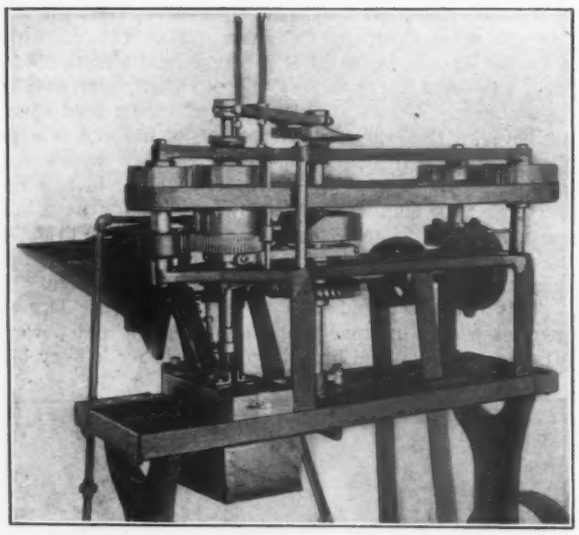


Fig. 1.—The Head of Rodd's Automatic Nut Tapper.

Referring to the illustrations, the drive is imparted to the horizontal shaft *a*, Fig. 3, and thence through bevel gears to a vertical shaft, from which the tap spindle is driven by an endless belt. Motion is also transmitted from the driving shaft to the vertical cam shaft *c* through worm and worm gear *d*. The tap spindle shaft *b* runs in a quill, *e*, which is supported at its upper end by the ball race *f*, the function of which is to take up the upward thrust of the clutch to reduce friction. The tap spindle is splined to the quill, so as to rotate with it, but is free to slide up and down. It is raised by the cam *g* on the vertical cam shaft working through the fork *h* and collar, and descends by gravity.

Mounted on and attached to the quill *e* is a cone clutch, *k*, which is adapted to engage with the pulley *i*, mounted loosely above the clutch on the quill. This mechanism permits the application of the fundamental principle of the machine, that of an endless belt revolving a tap, tapping at slow speed and withdrawing at high speed.

The lower half of the clutch consists of a cone, *k*, which carries on its outer edge, integral with it, the gear *r*. The cone is loose in the cup *i*, and is recessed on its under side for the hardened steel ball races *l*. It receives its thrust motion upward to engage with the cone pulley from the pressure of the springs *m* located in the frame of the machine. These springs, which are easily adjustable for tension, support the ball race *l*. As the center cam *o* revolves its lower edge releases the fork *p*, allowing the clutch *k* to be thrown into engagement by the springs. Simultaneously the belt is shifted by the upper face of cam *o* to the idler pulley *j*, and the tap is revolved at slow speed, being driven from the forward pulley *q* through the train of gears *r*, *s* and *t*. On completion of the tapping operation the cam draws the cone *k* out of engagement, removing the pressure from the ball races, and the belt shifts to the clutch pulley *i*, causing the tap to reverse at high speed. Simultaneously, the spindle is lifted by the cam *g*, the nut is dropped from the tap and another blank is immediately brought into position ready to be tapped.

The blanks, which should be uniform in size and diameter of hole, are placed in the hopper *u*, and by means of suitable mechanism are fed through a chute into a pocket, from which they are transferred successively to position beneath the tap by the action of the lever *v*, which once in each cycle is oscillated by a cam near the lower end of the cam shaft *c*. If a tap breaks or refuses to act, the feeding of blanks stops automatically until the trouble is corrected. It will be noticed that the threading of the nut is always performed through the train of gears without the use of lead screws or other complicated mechanism, the tap entering the nut by gravity, assisted if necessary by the pressure of a spring on the top of the fork *h*, the tension of which may be regulated or entirely released. Withdrawing the tap

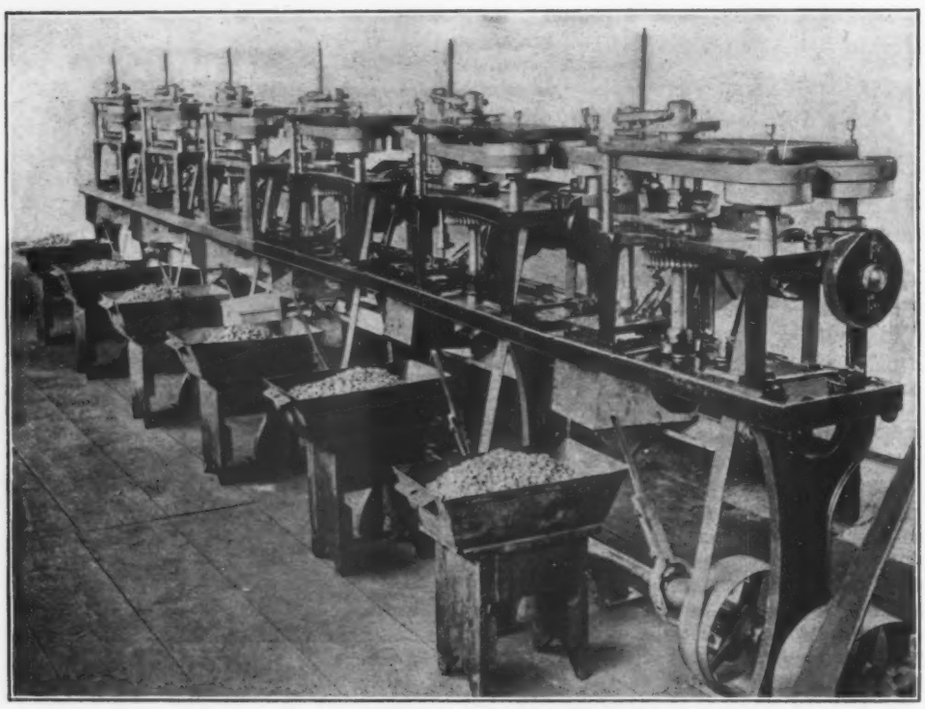


Fig. 2.—A Group of Six Tappers Mounted on One Base.

from the nut is accomplished by the open belt, the train of gears and clutch meantime running idly. The rear idler pulley *w* is carried on an eccentric sleeve which may be revolved by the attached handle and serves to take up the slack in the endless driving belt; this adjustment may be made while the machine is in motion.

The Rodd nut tapper is at present built in sizes to handle nuts from ⅛ to ½ in., and larger sizes to order. The machine may be used singly, as shown in Fig. 1, or in groups of two or more. The manipulation is so simple that one attendant can usually take care of six or eight. A machine of six unit type is shown in Fig. 2. Each unit has its own separate driving clutch on the single main countershaft, which is preferably mounted beneath the table on the legs of the machine; thus overhead belting is avoided and floor space saved. By the method of driving through individual clutches greater facility is obtained in setting up and handling work and the taps. All the operations of the tap threading and withdrawing are in plain sight. It is impossible to mix blanks and finished nuts. A forced system of lubrication is provided, together with catch pans for returning the lubricant to a common center for redistribution. The wearing parts of the machine are of steel, hardened where necessary, and the bearings are of bronze. All gears are cut.

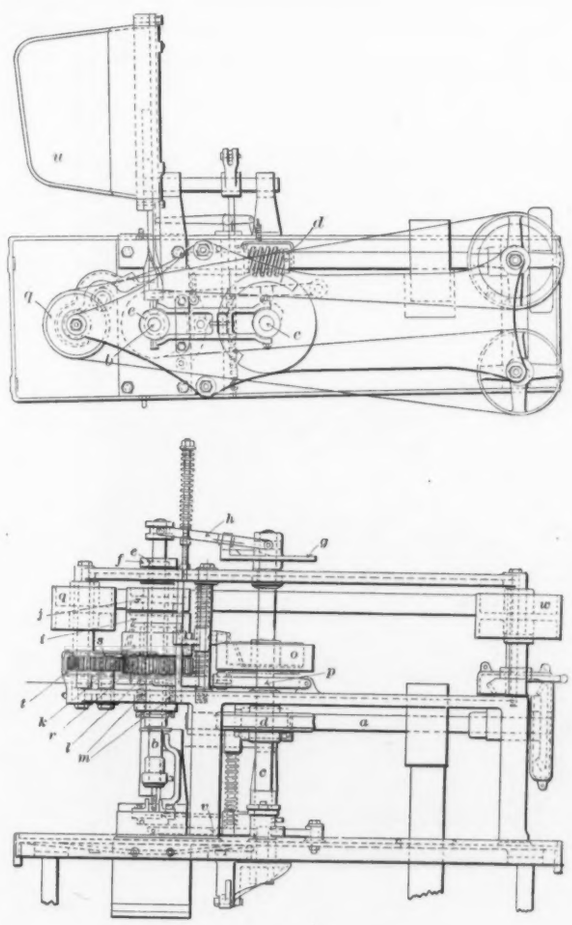


Fig. 3.—Top View and Front Elevation of the Working Parts of Rodd's Automatic Nut Tapper.

The record of one of these machines for 22 days in one month shows that tapping ⅝-in. United States standard steel nuts, 16 threads to the in., each tap used on the machine during the period tapped on the average 63,955 nuts, so that the cost of tapping was very low.

The No. 1 machine taps 5-32, 3-16, ¼ and 9-32 in. nuts, at the rate of 30, 30, 27 and 25 per minute, respectively, weighs 550 lb. and occupies a floor space of 29 x 35 in.; the No. 2 machine taps ¼, 5-16 and ⅜ in. nuts at the rate of 27, 25 and 23 per minute, respectively, weighs 600 lb. and requires a floor space 30 x 48 in., and the No. 3 machine taps 7-16 and ½ in. nuts at the rate of 16 and 13 per minute, respectively, weighs 675 lb. and requires a floor space 32 x 48 in. Each machine will tap a nut of any thread common to the sizes within the respective capacities stated above.

Customs Decisions.

Miners' Diamonds.

A customs controversy, involving nearly $1,000,000 worth of imports annually, has arisen between the Government and importers of so-called miners' diamonds used extensively by miners in the construction of drills. For many years it has been the practice of the Treasury Department to admit the diamonds duty free, under the provision in the tariff for "miners' diamonds, not set." The Government now comes forward and insists that, as the diamonds are advanced in value by splitting or cutting, they should be classified under paragraph 445 of the law, which specifies duty at the rate of 10 per cent. To determine the correctness of the Government's action in returning the stones for duty, a test case has been brought by the Sullivan Machinery Company, Chicago. Hearings have been held before the Board of United States General Appraisers. At the request of John A. Kemp, solicitor of customs, General Appraiser Sharretts has granted an adjournment of the case until March 13, to enable the Treasury counsel to produce witnesses to substantiate the contention for the imposition of the 10 per cent. duty.

The Board Refuses to Mandamus a Collector.

The Board of United States General Appraisers has laid down the principle that the tribunal has no authority to issue an order in the nature of a mandamus to compel a collector of customs to grant a reappraisement after such official has declined to accede to the request of an importer. It appears that R. F. Downing & Co., New York, imported an automobile which was assessed by the collector at a valuation deemed excessive by the importer. Thereupon an application was lodged with the collector by the firm within the prescribed time demanding a reappraisement before the Board of Appraisers. The collector reported to the board that he refused to transmit the request on the ground that no regular entry of the merchandise had been made and no certified invoice presented. The importer's contention in writing follows:

> It is respectfully submitted that the protest must be sustained and that the liquidation of the collector must be declared invalid and of no effect, and that this board order the collector to forthwith direct a reappraisement, as originally demanded.

In dismissing the protest Judge Somerville, in his decision for the board, says in part:

> The application of the importers is tantamount to requesting the board to grant what in legal effect would amount to a mandamus to the collector, ordering him to grant a reappraisement. Such an order could not be made without express statutory authority. It has been held that even the circuit courts of the United States have no jurisdiction of an original proceeding seeking relief by mandamus.

Steel or Stamped Shapes.

The Board of United States General Appraisers has taken adverse action on a protest filed by the Cleveland Stamping & Tool Company, Cleveland. It was decided that so-called steel shapes are properly dutiable at 45 per cent. ad valorem under the steel provisions of the tariff. It was alleged by the importers that the merchandise should be admitted to classification at specific rates as "stamped shapes." In overruling the protest, the decision says, in part: "No evidence has been offered to sustain the importer's contention as to the character of the merchandise. The case has been submitted for our decision on the record, and various official samples forwarded with previous protests of the same importer are said to properly represent the goods here in question."

Tube C, the third of the Pennsylvania Railroad tunnels under the East River connecting New York with Long Island, was put through March 5. Boring in the first two tubes was completed a few days previous. The last of the four will be put through by the end of this month.

Boiler Feed Water Treatment.

All natural waters contain some impurities, the kind depending upon the nature of the soil or strata over or through which the water has passed. When introduced into a steam boiler the impurities are precipitated, either because the water at the higher temperature loses its power of holding in solution these impurities, or, owing to the concentration from the evaporation of some of the water, the remainder becomes supersaturated and the impurities in excess crystallize or otherwise deposit.

The Causes of Scale.

When deposited in a steam boiler these impurities take the form of scale, more or less hard and adherent, depending upon the nature of the impurities and the rate and temperature at which the boiler is operated. This scale is a source of annoyance and expense, and is often so serious as to be dangerous. Occurring as it does on the heated parts of the boiler, it materially reduces the efficiency of the transmission of heat through the metal. If the scale is very thick the resistance to the passage of heat may be so great as to overheat the metal, thus reducing its strength and causing a dangerous condition to ensue, which may result in bagging of the plates, rupture of the parts, or even explosion. This scale must be removed from time to time.

Nature does not provide us with water that is soft and clear, except in rare instances. Nearly all natural waters, whether from streams, lakes or wells, hold in solution and suspension both organic and inorganic matter. The organic substances are vegetable and animal, and are taken up either by flowing over the ground or by direct contamination from city or factory wastes. These substances, however, are not usually present in sufficient amount to be objectionable for boiler feed use. The inorganic impurities, such as lime, magnesia and iron in combination as carbonates, sulphuric and hydrochloric acid, a small amount of silica and the oxides of iron and alumina, are the ones which cause trouble for the steam plant owner.

The Causes of Corrosion.

Some natural waters contaminated from coal mines and other industries contain free acid, such as sulphuric, which causes considerable trouble from corrosion. There are also some salts, such as magnesium chloride, which at the temperature of the boilers are dissociated and liberate acids which rapidly destroy the metal of the boiler.

Remedies for Bad Feed Water.

There are three ways by which it is possible to operate steam boilers on hard water. The first and oldest, consists in scraping and picking the scale from the boilers. This is expensive, laborious and often ineffectual; but, having been resorted to for so long it is considered by some the only proper method, notwithstanding the expense.

The second is the use of chemicals introduced directly into the boiler to throw the scale forming matter into suspension in a form that will not adhere to the boiler as scale. This, with the compound introduced, fills the boiler with a muddy, insoluble mass. Blowing off only partially removes the suspended mass. To blow it all out would mean emptying the boiler and introducing fresh water, requiring more compound and the formation of a similar mass of sludge. The steam leaving the boiler takes none of the sludge with it unless the boiler is priming, when it is carried over mechanically, and may cause trouble in the engines. This muddy, insoluble mass increases the density of the water in the boiler, thus raising the boiling point (for the same reason that it requires more heat to boil sea water, and more heat to boil molasses than either), which means more heat, and therefore more fuel. And not only the expense of additional fuel, but the cost of the compound must be taken into consideration.

The chemistry of boiler compounds is correct and is thoroughly understood. But a boiler is a still of high efficiency under proper conditions, and not a retort for carrying on chemical reactions, all of which require heat in addition to interfering with steam generation in the boiler, nor is a boiler designed for storing suspended matter.

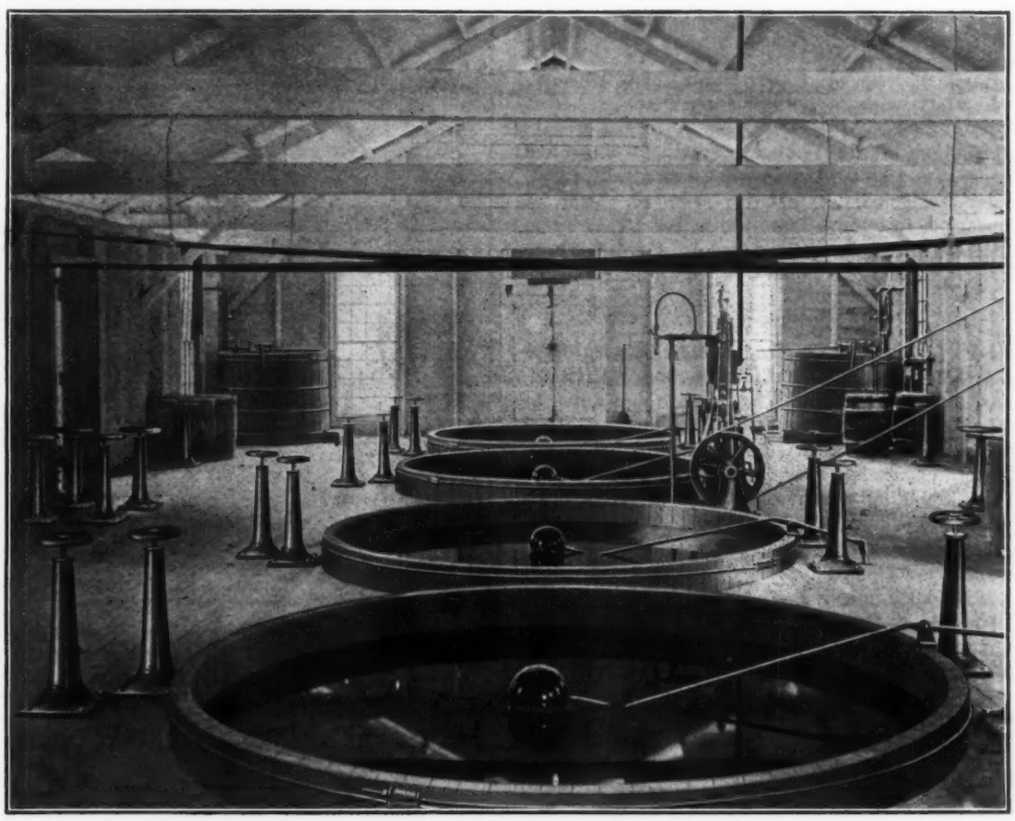
The third way to take care of steam boilers is to feed into them nothing but clear soft water. Inasmuch as it is generally impossible to obtain a natural supply which will allow boilers to be operated economically, the consideration of the best means for eliminating the in-

Exterior View of a 10,800-Hp. We-Fu-Go Water Softening and Purifying System Installed for the Woodward Iron Company, Woodward, Ala., by the Wm. B. Scaife & Sons Company, Pittsburgh, Pa

crusting and corroding substances from the water before feeding it into the boilers is important. There are only two methods, distillation and chemical softening and purification of the water. Distillation is at a disadvantage on account of the extremely high cost of the apparatus and the continued high cost of producing distilled water. An apparatus to economically distill 10,000 gal. of water per hour by means of quadruple effects will cost about $40,000, and the best figure on record for distilling 1000 gal. of water, with coal at $2 per ton, is in the neighborhood of 40 cents. With the ordinary distilling apparatus with coal at the same cost, the cost of distillation runs as high as $5 per 1000 gal.

The Chemical Softening and Purifying of Water

appears to be the ideal and correct way to prepare the ordinary boiler supply. Although the process of water softening was discovered by Cavendish as early as 1766, and later in the same century by Thomas, it was not tried on a practical basis until 1841, when Dr. Thomas Clark of Aberdeen, Scotland, built a water softening system, and later, in conjunction with Porter, brought out the lime and soda process used to-day.



View Showing the Interior of the Operating House and the Filters of the Same Water Softening and Purifying Plant.

All sorts of substances have been tried, but so far none have produced as efficient results for the same cost as can be obtained with lime and soda. Mechanical devices of every kind have also been tried. Feed water heaters are frequently advertised as water purifiers, and they are to the extent that by heating the water to about 212 degrees they precipitate some of the carbonates of lime and magnesia. Live steam heaters fitted with pans for catching the precipitation of the scale forming matter and in which the water is raised to boiler temperature, are also in use to a considerable extent. However, heat alone does not bring about the complete purification of water unless concentration occurs, which cannot be effected in any type of feed water heater. Even with the introduction of chemicals into feed water heaters, complete purification cannot be effected, because sufficient time is not allowed for the reactions to take place. Mechanical devices consisting of floats, skimmers and filters have been applied to make the boiler assist in the purification of the water, but as there is neither energy nor space to spare in the boiler to effect it, these devices have failed to give thoroughly satisfactory results. It therefore seems best to apply the chemical softening and purification of the water before feeding it into the heaters and boilers.

A Typical Equipment.

To obtain the best results from a water softening and purifying system it is essential to have accurate chemical treatment, a thorough mixing of the reagents with the water, apparatus large enough to allow time for chemical reactions to take place, means for mixing the sludge of previous softening to accelerate chemical reaction and hasten sedimentation by weighting the new finely divided precipitate, and a crushed quartz or sand bed filter to insure perfect clarification, so that the water which goes to the boilers is clear. A water softening and purifying system installed by the Woodward Iron Company, Woodward, Ala., embodies these features. This system consists essentially of four treating and settling tanks equipped with mechanical stirring devices operated by power, reagent or chemical mixing tanks with stirring devices, and jet pumps for introducing the reagents into the treating tanks, and four filters to effect final clarification.

The treating tanks are filled one after the other with water, and while a tank is filling the reagents are introduced and thoroughly mixed with the water by the mechanical stirring device, which consists of an especially designed paddle revolved by the power furnished from a small engine. This paddle not only mixes the reagents with the water, but at the same time stirs up from the bottom the lime sludge of previous purification. This lime sludge floats in the water, hastens the chemical reaction and causes the new finely divided precipitate to form large woolly flakes heavy enough to settle as soon as the water stops moving. After a tank is filled the stirring device is stopped and the water permitted to stand, to allow the precipitate to settle to the bottom of the tank. The softened water is taken out of the tank through a hinged floating outlet pipe, arranged to rise and fall with the water, so that the pipe always draws water from the top. The water at the top being clearest, carries the least amount of floating sludge through the floating outlet pipe to the filter beds; therefore the filters can be operated for a long time without being cleaned. The rate of flow to the filters is automatically

controlled, so that they are supplied with water as fast as it is drawn from them.

While one tank is being filled, treated and settled, one of the other tanks is supplying treated water, and by the time it is empty another tank is ready to use. In this way a constant supply of soft, clear water is always on hand. This system is so arranged that any treating tank can be used with any or all filters, and the entire system can be operated from the filter house located between the treating tanks, as is shown by the accompanying illustration.

The following are the analyses of the water before and after being softened and purified:

Creek Water.	Grains per U. S. gal.	*Creek Water After Being Softened and Purified.*	Grains per U. S. gal.
Volatile and organic matter	0.70	Volatile and organic matter	0.15
Silica	0.85	Silica	0.45
Oxides of iron and alumina	Trace	Oxides of iron and alumina	Trace
Calcium carbonate	4.46	Calcium carbonate	1.45
Magnesium carbonate	1.30	Magnesium hydrate	0.36
Magnesium sulphate	2.46	Sodium carbonate	0.38
Sodium sulphate	1.35	Sodium sulphate	3.12
Sodium chloride	0.82	Sodium chloride	1.48
Sodium nitrate	0.24	Sodium nitrate	0.35
Total solids	12.18	Total solids	7.74
Suspended matter	0.60	Suspended matter	0.05
Free carbonic acid	0.33		
Incrusting solids	9.77	Incrusting solids	2.41

Thus it will be seen that the incrusting solids have been reduced to a point where scale cannot be formed, and the corroding substances entirely removed. It is, of course, impossible to remove from the water all the scale forming matter, but it can be reduced to a point where scale cannot form and the boilers can be kept clean indefinitely.

Chinese Pig Iron in the United States.—Consul-General Charles Denby of Shanghai, China, has written recently concerning shipments of pig iron from China to the United States. Referring to the shipment of 1500 tons of basic iron made to the Atlantic Coast in July, 1907, he says that the price laid down in Brooklyn was $17.50, gold, per ton, including freight of $4.75 a ton from Hanyang to destination. The Hanyang Iron Works are located on the Yangtse River 600 miles from the sea, and from the Chinese seaboard to New York via Suez Canal the distance is 14,000 miles. Such shipments as the above are made possible by the fact that oceangoing vessels can reach Hanyang with 18 ft. draft at nearly all seasons of the year, permitting the loading of cargoes of 2000 tons, and there is no subsequent breaking of bulk. An American company operating a number of trans-Pacific steamships under the British flag has the agency of the Hanyang Iron Works for the supply of Chinese pig iron to the Pacific Coast. Occasional quantities of pig iron are delivered at San Francisco by these vessels, as well as by the Pacific mail steamships. It may have been noticed by our readers that the San Francisco iron market report of *The Iron Age* gives regular quotations on Chinese pig iron. The shipments of pig and manufactured iron from the Chinese Government works at Hanyang in the year 1906 amounted to 41,050 tons, valued at $825,000, gold, an increase of tenfold in 10 years.

The new Wisconsin State Mining Trade School at Platteville, Wis., established by act of the Wisconsin Legislature of 1907, was opened for students January 28, 1908. The first catalogue has just been issued. A two years' mining course is provided. Underground work is required for a diploma and a minimum of 96 shifts must be worked, half of the time in coal mining and half in metal mining. Platteville is located in the southwestern corner of Wisconsin, in a district in which lead mining was carried on a century ago. Within a mile of the mining school six productive zinc mines are now being worked. A large body of zinc ore underlies the mining school building, and plans are under way to sink a shaft for its development. The director of the school is Robert B. Brinsmade, instructor in mining and natural science.

The Burke Two-Spindle Automatic Milling Machine.

With the exception of the automatic knee and a slight variation in some of the dimensions, the machine illustrated is similar to the two-spindle milling machine illustrated in *The Iron Age* April 25, 1907, built by the Burke Machinery Company, Cleveland, Ohio. The new feature, however, is a radical one—a knee which raises, reverses and lowers automatically—and this machine is the only one of its type on the market. It is especially designed for use in typewriter factories, where there are large numbers of duplicate parts to be milled, and four or five of the machines, it is claimed, can be operated by one girl.

Fig. 1 is a general view of the machine and Fig. 2 gives elevations from which the automatic operation of the knee may be understood. In a recess in the front of the machine is mounted a drum cam, *a*, which rests on

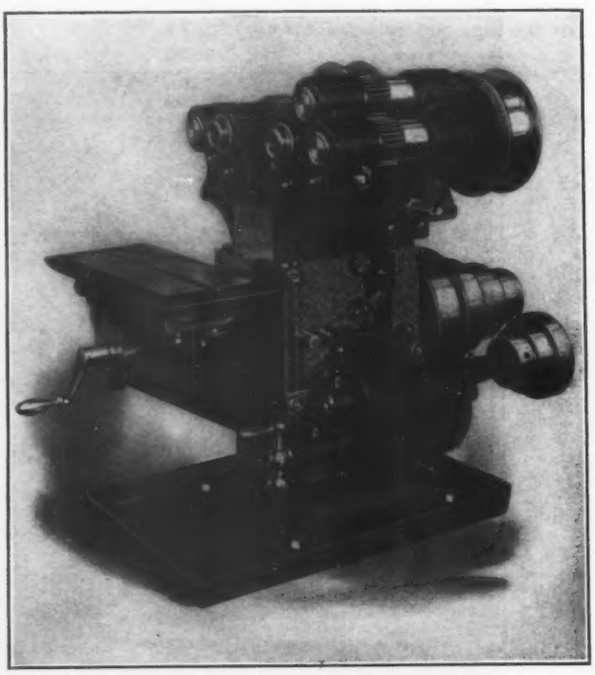


Fig. 1.—The Two-Spindle Automatic Milling Machine Built by the Burke Machinery Company, Cleveland, Ohio.

a ball thrust bearing and is held at the top by a dead center. The spiral groove in this cam has two pitches, a coarser one at the bottom and a finer one at the top. By means of these different pitches the knee is raised and lowered at different speeds, rising rapidly until the work engages the milling cutter and then more slowly while the cut is being taken. After the machine is reversed the knee travels downward again at an increased speed until the work is clear of the cutter and then drops very rapidly to the starting point.

The cam is revolved by a worm wheel attached to the bottom of it, driven by a worm on a cross shaft, which is bevel gear driven from the feed gear box mounted on the side of the column. The knee is adjustably mounted on an intermediate saddle bearing against the front face of the column, so that its vertical position, when the faster elevating movement changes to the slower one, may be varied to suit the work and the cutters. The intermediate saddle carries a roller follower engaging in the spiral groove of the cam. The limit of the upward movement at the slower speed may be altered to suit the work by shifting the adjustable stop *d*. The spindles rotate in opposite directions and the work is passed between the cutters, the two ends of a piece being thus cut simultaneously with a downward cut in each case.

Assuming the work to be set up and the various adjustments made, the operation is started with the knee in its lowest position. The lever *b* is depressed and the lever *c* raised to the respective positions shown in Fig. 2. Then the clutch mechanism associated with the lever *c*

is thrown in by depressing that lever, which causes the knee to rise, first rapidly until the cutting begins and then slowly until the adjustable stop *d* lifts the lever *b* and the overlapping lever *c*. When these reach the position where the pin *e* registers with a slot the pressure of a spring behind the pin causes it to enter the slot, and the clutch is thrown past the center so as to engage on the opposite side, causing the knee to descend again to its starting point, as determined by an adjustable stop limiting the lowering movement. The clutch is then disengaged and the knee comes to rest and remains so until the work is removed, a new piece substituted and the operation repeated by setting the levers as described.

The table has a longitudinal adjustment of 6 in., a transverse feed of 1½ in. and a maximum vertical movement of 5½ in. The adjustment of the knee on the intermediate slide is 3 in. The working surface of the table is 12 x 5 in. The maximum and minimum distances between the two spindles are 6½ and 4 in. No. 9 B. & S. taper holes are provided in the ends of the spindles. The overall hight of the machine is 25 in. and the weight 475 lb. The machine may also be used for surface milling, and with both spindles working simultaneously the capacity is practically double that of a single miller.

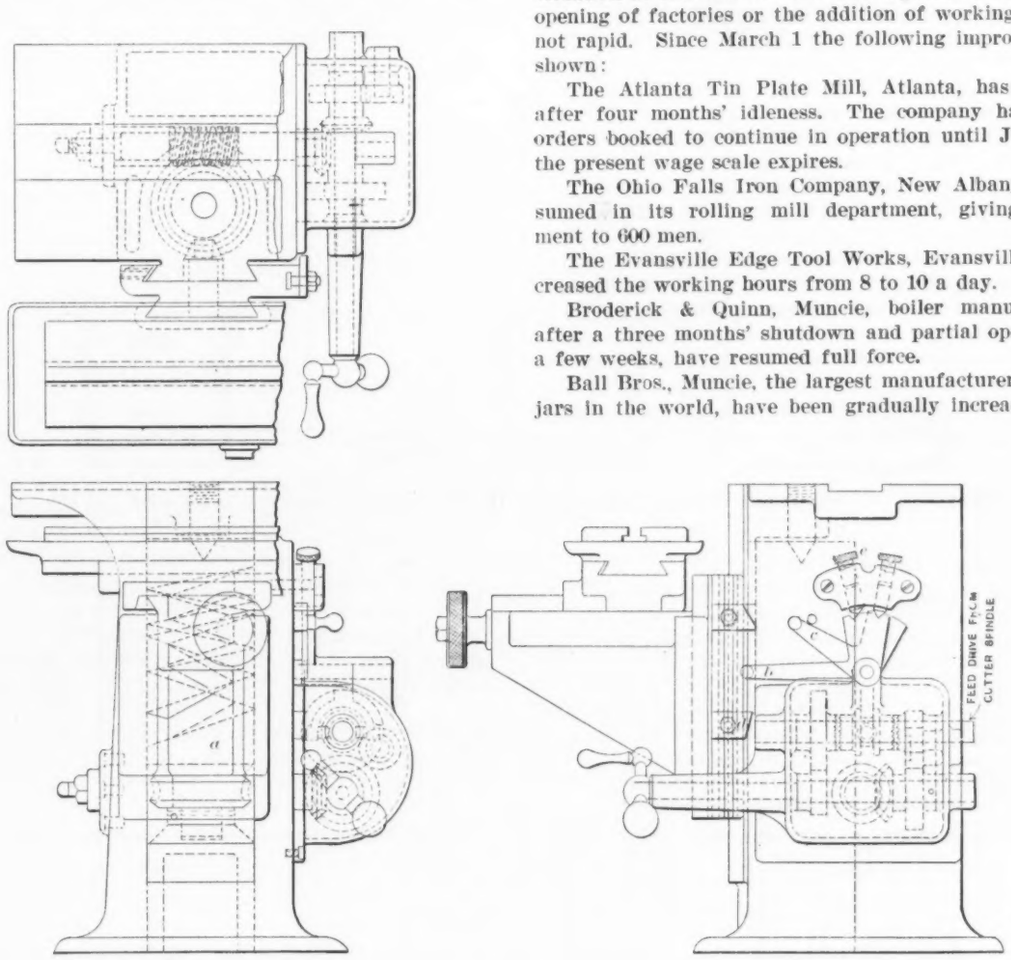


Fig. 2.—Top, Front and Side Views, Showing the Mechanism Effecting the Automatic Raising and Lowering of the Knee.

The Philippine Islands and United States Trade.—We have received a brochure of some 60 pages entitled "Reciprocal Trade," from Harold M. Pitt of the Publicity Committee of the Manila Merchants' Association, Manila, P. I. This publication is intended to develop a sentiment in favor of free trade between the United States and the Philippine Islands, and presents strong arguments therefor. It gives comprehensive statistical articles on specific subjects. For instance, chapters are specially devoted to agricultural implements, iron and steel manufactures, brass and copper products, instruments and apparatus for scientific purposes, cotton goods, &c. Tables are presented which show how little the United States is exporting to the Philippines at present and what the increased volume of such exports would probably be if our trade relations with the islands were on the same basis as with Porto Rico, which has enjoyed free trade with the United States since 1901. Those who are interested in this matter can doubtless secure copies of the work by addressing the Publicity Committee of Manila Merchants' Association, 27 Escolta, Manila.

Indiana Industries Reviving.

INDIANAPOLIS, IND., March 16, 1908.—The industrial situation in Indiana continues to brighten, though the reopening of factories or the addition of working forces is not rapid. Since March 1 the following improvement is shown:

The Atlanta Tin Plate Mill, Atlanta, has reopened after four months' idleness. The company has enough orders booked to continue in operation until July, when the present wage scale expires.

The Ohio Falls Iron Company, New Albany, has resumed in its rolling mill department, giving employment to 600 men.

The Evansville Edge Tool Works, Evansville, has increased the working hours from 8 to 10 a day.

Broderick & Quinn, Muncie, boiler manufacturers, after a three months' shutdown and partial operation of a few weeks, have resumed full force.

Ball Bros., Muncie, the largest manufacturers of fruit jars in the world, have been gradually increasing their force until 950 of the 2000 employees are again at work.

All but one of the 55 manufacturing plants of Kokomo are again in operation. Not all are running full time or with full forces, but it is believed that such a condition will be reached this spring. The Kokomo Steel & Wire Company, having the largest plant, employing 1000 men, has exceeded in the last eight months the business done in any corresponding period since its organization, seven years ago.

The Chicago Sewer Pipe Company, Brazil, has resumed with a full force, after a suspension of six weeks. Nearly all the factories in the city are now working full forces.

The Caldwell & Drake Iron Works, Columbus, has been forced to night work to keep up with orders. The company has never been busier.

The large double tank factory of the American Window Glass Company, Hartford City, is in blast again, giving employment to 600 workmen. It is the largest machine equipped plant west of the Alleghenies. It was idle since September, since which time, however, it has been rebuilt and doubled in capacity. It is known as the No. 3 plant. Fires have been put under tank No. 2, and it will soon be in operation with 300 men.

Charging Machines for Cupolas.*

BY G. R. BRANDON.†

The very simplicity of the work of collecting charges and of the operation of charging itself has induced neglect of this important department. A little study into methods might lead to the adoption of a more efficient vehicle for carrying charges, the use of cars, for example, with roller bearings and running on tracks instead of wheelbarrows. The arrangement of tracks to permit through routing and the location of the scale for weighing charges are of an importance frequently overlooked, and it is surprising that in this enlightened day the long inclined plane, taking up much valuable space and with its laborious methods, is still used in place of the modern foundry elevator. Where the material handled is in sufficient quantity a quick acting electric traveler should be installed to cover the entire stock yard, to unload pig iron, fuel and supplies and also handle flasks. A magnet can be used for handling pig iron and a drop ball for breaking scrap with distinct advantage. Charges may be collected from different parts of the yard and raised to the charging floor with a crane at minimum expense. The charging operation lends itself to power manipulation, and consequently at this point a saving in labor may also be obtained. The purpose of this paper is to describe the charging machine developed and manufactured by the Whiting Foundry Equipment Company, Harvey, Ill.

The designers are indebted to the blast furnace operators for the idea of the charging machine. Every one is familiar with the skip hoists and the great saving effected over the old practice of using elevators and dump buggies pushed by laborers. This refinement in handling charges naturally was introduced by the blast furnace people, as their operations are continuous for months, 24 hr. a day. The elimination of laborers made tremendous economy in cost of production. The skip hoist is an end dump and is fitted with automatic features which would not be applicable to the conditions in cupola practice. There have been end dump machines used for cupolas, and the author believes such a device is in use at the Pennsylvania Car Wheel Company. The Whiting Company has adopted the side dump, claiming it to be simpler and better for continuous movement of cars. Other advantages are that there is less handling of cars and a narrower charging floor is permissible.

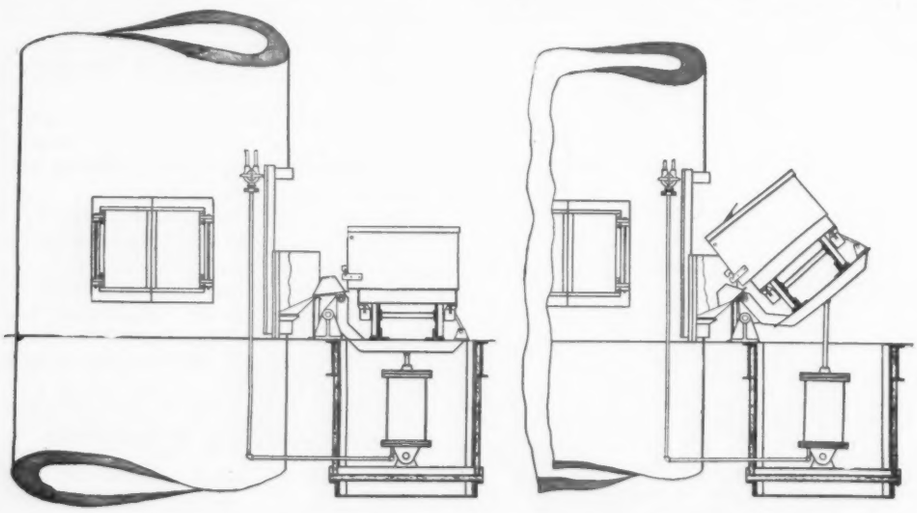


Fig. 1.—The Whiting Cupola Charging Machine with the Car Ready to Dump and in Dumping Position.

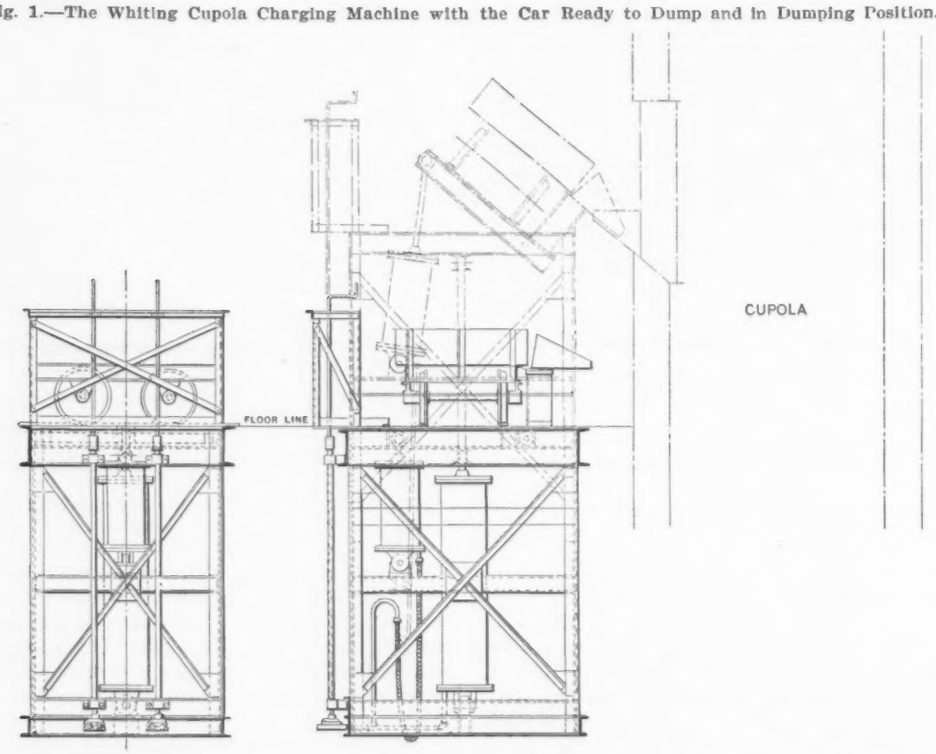


Fig. 2.—Front and Side Elevations of a Whiting Compound Cupola Charging Machine Arranged to Elevate the Car Before Dumping It.

The construction of the Whiting pneumatic machine

* From a paper read before the Pittsburgh Foundrymen's Association, March 2, 1908.

† Whiting Foundry Equipment Company, Harvey, Ill.

is illustrated in the drawings. Fig. 1 gives elevations of the machine with the car in position ready for raising and in dumping position. The machine consists of a platform hinged at a level above the charging platform on the side toward the cupola, provided with a track for the charging car in line with the stationary tracks, guard angles, as shown, and a hook for holding the car to the platform when being dumped. A dumping cylinder is supported by framing attached to the charging floor and pivoted to allow the slight swing required when the platform is tipped. The piston rod is pivoted in a bracket attached to the underside of the platform. The platform is constructed of structural shapes and all joints are strongly riveted; the hinge pins are of ample size and are arranged for easy removal and replacement. An apron plate is hinged to the platform and laps over an inclined chute in front of the cupola door. The controlling valve is located at any convenient point and is piped to the cylinder and connected with the air supply.

In operation, the car is run on the platform and the hook engaged with an eye attached to the car frame. Then the valve is opened to admit air into the operating cylinder, and the platform is raised to the dumping position. The iron charges are put on cars with ends about 12 in. high, but open on both sides. Coke cars have ends and sides inclosed, one side being fitted with a hinged door. By manipulation of the valve the charges may be distributed as desired. The level of the charges must be maintained 3 to 4 ft. below the level of the door sill to get the best results. Electric power may be used in place of compressed air, using a geared hoisting machine. The ordinary crane controller will give the different movements and speeds required.

A device of this character is necessarily of greatest benefit where the cupola output is large and the speed of melting relatively high. A cupola 54 in. in diameter inside of lining is about the smallest size which should be charged by machine. With a No. 9½ Whiting cupola, 90-in. shell, 72 in. inside diameter, and melting 20 tons per hour, two men with the charging machine perform the work which would otherwise require five or six men. Assuming the duration of heat to be 4 hr., the saving in labor will be 12 hr. time, at, say, 17½ cents, or $2.10 per day, which represents an annual saving of $630, or about 200 per cent., on the investment.

The charging door in the cupola for use with this machine is 9 in. above the charging floor. To obtain maximum economy of fuel the charging floor should be from 20 to 24 ft. above the bottom plate, or about 5 ft. higher than for hand charging. Other charging doors, at ordinary hight for hand charging, are located at the sides for use in emergency, and for leveling the stock charged by the machine if this should ever be necessary.

The company has devised a compound machine, shown in Fig. 2, for use in connection with low charging floors, consisting practically of an elevator of the plunger type, which lifts the car and charging machine together to the required level. The two mechanisms are controlled independently and may be operated by pneumatic power, as shown, or by electric power. The original charging doors may be left in the cupola, being shifted as necessary, and used for hand charging and leveling.

A few diagrams showing actual layouts of charging floors and tracks may be of interest. Figs. 3 and 4 represent the cupola charging department of the Canada Car Company, Montreal, Que. There are two No. 9½ Whiting cupolas for the wheel foundry and one No. 7 and one No. 4 for the gray iron foundry. All are equipped with charging machines. The two foundries adjoin and the charging houses are connected, giving ample track space on the charging floor and providing storage facilities below, very desirable in that vigorous climate. The tracks on the charging floor are arranged with cross ovens, so that cars may travel continuously without interference. On the ground floor layout, Fig. 3, attention is called to the location of the scales in relation to the elevator, and the arrangement of tracks, which permits the passing of empties to the yard without interfering in any way with loaded cars ready to be elevated to the charging floor.

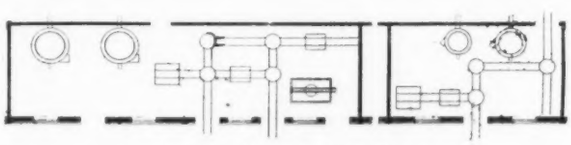


Fig. 3.—Ground Floor Plan.

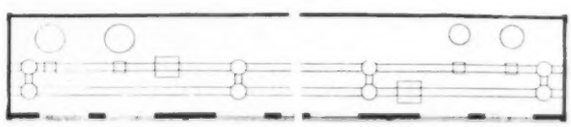


Fig. 4.—Charging Floor Plan.

Cupola Charging Arrangement in the Canada Car Company's Foundry.

Fig. 5 shows the layout of the ground floor and Fig. 6 of the charging floor for the wheel foundry of the American Car & Foundry Company, at Madison, Ill. Two No. 11 Whiting cupolas are used in this foundry and both are charged by Whiting pneumatic machines. The special location of the elevators was necessitated through the peculiar yard arrangement. The end elevators are used for iron and the one on the side for coke. Each cupola is served by the elevator nearest it in ordinary operation. The tracks on the charging floors have storage capacity for about 70 cars. A transfer table at each end is arranged so that a loaded car from the elevator may be transferred to any storage track; turntables in the middle provide passage from any one track to any other, and empty cars are transferred from the charging track to the elevator, thus completing the circuit.

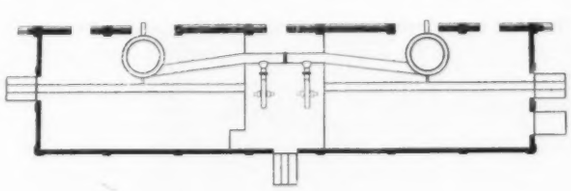


Fig. 5.—Ground Floor Plan.

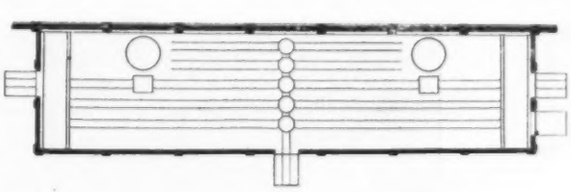


Fig. 6.—Charging Floor Plan.

Cupola Charging Department of the American Car & Foundry Company's Plant at Madison, Ill.

New German Battleships.—The Nassau, the largest battleship in the German Navy, was launched March 7 at Wilhelmshaven. Its dimensions are as follows: Length, 472 ft.; beam, 82 ft. 9 in.; draft, 26 ft.; tonnage, 18,000; horse power, 25,000, and speed 19 knots an hour. Its armament will consist of 12 11-in., 12 6.6-in. and 8 3.4-in. guns, together with six torpedo tubes for the discharge of a torpedo 19 in. in diameter. The Nassau is built entirely of hardened steel, is to be fitted with three sets of triple expansion reciprocating engines and is to be provided with three propellers. The cost of construction, including trial runs, will total $9,190,000. A twin ship in every respect, the Sachsen, is to be launched from the Weser Yard at Bremen in a very short time, while work is proceeding rapidly on the Wurtemberg at the Vulkan Yard, Stettin, and on the Baden at the Germania Works, Kiel.

Steam Heat from Electric Locomotives.

BY C. M. RIPLEY.

Not the least of the problems connected with the new railroad terminals now being built in New York City was that of heating the passenger coaches while they are handled by the electric locomotives through the yards and tunnels and until they are regularly taken up by the steam locomotives. To install stoves for temporary use in the individual coaches was too expensive and dangerous to be thought of. To heat the cars by electricity would require a double equipment of heating apparatus in every coach, as steam heat would still have to be supplied during the major part of the run. The problem has been ingeniously solved in the two methods now in successful operation by the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Railroad. So far as these methods are identical they may be briefly described as follows:

In the electric locomotive is installed a vertical boiler, which, as soon as the steam locomotive is detached, is connected to the regular piping system of the train. Thus, with virtually no interruption steam heat is supplied to the coaches regardless of the change in the mode of traction, without necessitating any additions to the regular heating apparatus of the coaches. The fuel for this boiler is ordinary commercial fuel oil.

The illustrations herewith, Figs. 1 and 2, of the inside of one of the New York Central electric locomotives show the oil fired auxiliary steam boiler. The apparatus consists of a multitubular boiler mounted on a cast iron firebox lined with brick. The boiler has 800 ½-in. copper tubes, and is fitted with steam and water gauges, try cocks, safety valve set to 80 lb., blow-off connection and automatic feed water regulator. Water and oil are carried in two steel tanks under pressure. The pressure on the water is 135 lb. per square inch, which is sufficient to supply the boiler without employing a feed pump. The oil is stored at a pressure of 25 lb. per square inch. The air for supplying this pressure is taken from the main reservoir in the locomotive airbrake apparatus, and is reduced to feed the oil tank through a regulating valve.

The water tank is of 200 gal. capacity and is filled by attaching a hose on either side of the locomotive and

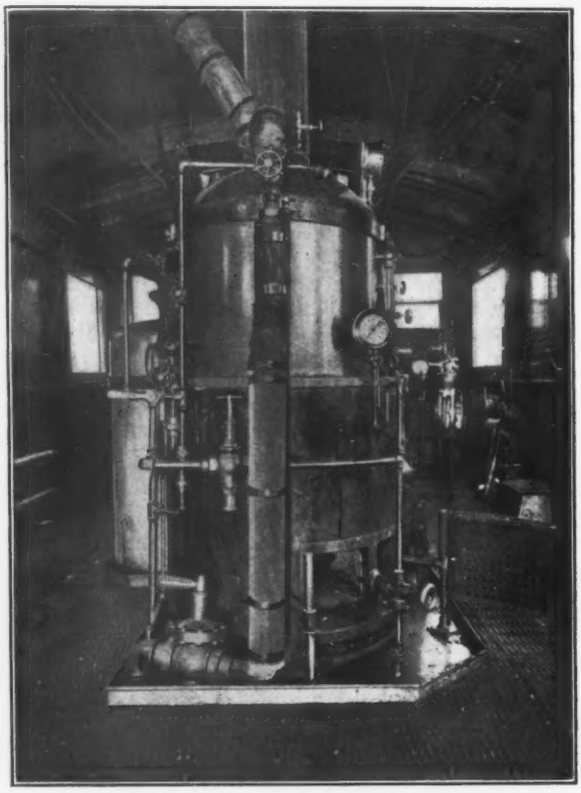


Fig. 1.—An Oil Fired Steam Heating Boiler Installed in a New York Central Electric Locomotive.

opening the vent valve on the top of the tank. The water is then forced up into the tank by the pressure on the mains. Try cocks are fitted to test the hight of the water in the tank. The oil tank, which is of 40-gal. capacity, is fitted with two glass gauges to enable the operator to ascertain the amount of oil contained. Water is led to the boiler through an air trap, which prevents air from blowing into the boiler should the water give out.

The main difficulty in connection with oil as a fuel is to obtain complete combustion of the ordinary com-

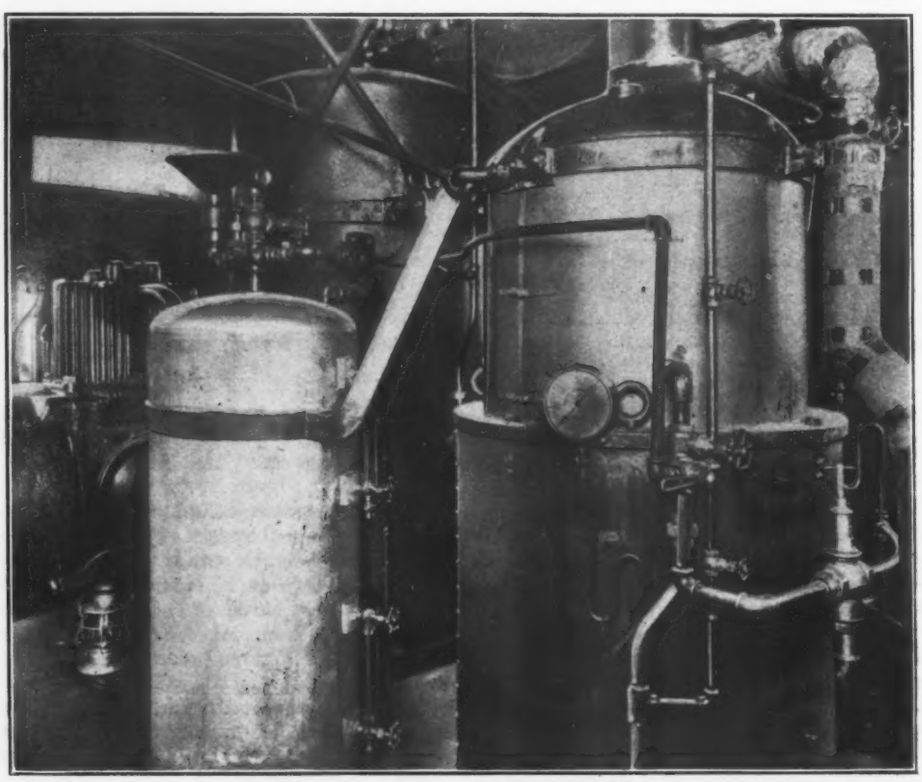


Fig. 2.—A Side View of the Same Equipment, Showing the Oil and Water Pressure Tanks.

mercial fuel oil, which is overcome by first completely atomizing the oil. To atomize each gallon of oil there is required approximately 60 cu. ft. of free air at a pressure of 15 to 25 lb. per square inch. There must then be supplied by one or the other of two means approximately 1440 cu. ft. more to give sufficient oxygen to the flame. The Kirkwood oil burning system manufactured by Tate, Jones & Co., Inc., Pittsburgh, Pa., which supplies the fuel for the boiler, is arranged to use either air or steam to atomize the oil. The change is made from one to the other by means of a threeway cock. Air is used to start the fire and steam when boiler pressure is reached. In Fig. 1 the screen is shown thrown back to better show the apparatus under the boiler.

The New York Central Method.

The New York Central apparatus is arranged to allow considerable space around the nozzle of the Kirkwood burner, through which air from the surrounding atmosphere is drawn into the combustion chamber by the force of the injected atomized oil. This method of drawing in the 1440 cu. ft. of air has been known to result in a noisy burner at times, and it has been open to the objection that it is difficult to control the amount of air drawn in. It is also obvious that the use of a greater amount of compressed air than is necessary for atomizing is required in order to draw in a sufficient amount of the surrounding air. This method makes out with compressed air any deficiency in the quantity of surrounding air drawn in. A decided advantage, however, in this method is that it makes unnecessary the expense of installing any extra blowing apparatus and means for driving it, both of which take up considerable room in the rather confined space of the electric locomotive.

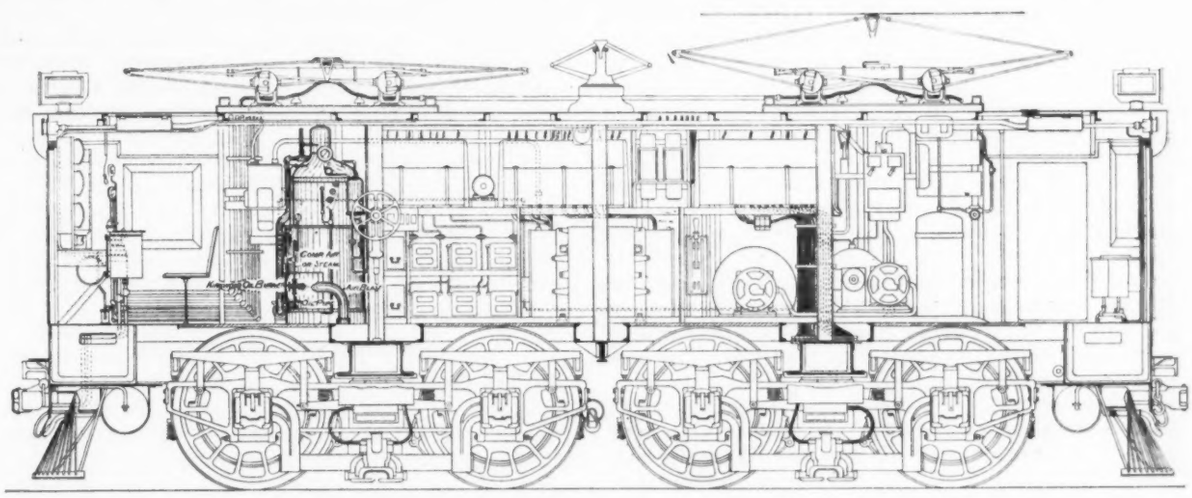


Fig. 3.—Sectional Elevation of a Pennsylvania Electric Locomotive Equipped with Oil Burning Steam Heating Apparatus.

The New York, New Haven & Hartford Method.

The electric system of the New York, New Haven & Hartford Railroad is rather unique in the field of American electric traction, inasmuch as transformers are used in the locomotive to reduce the voltage of the alternating current supplied. The advisability of cooling these transformers by air needs no further comment, and hence this company has made use of an air blast apparatus both to cool the transformers and to assist in the burning of the oil. Fig. 3 illustrates one of these electric locomotives in which a Kirkwood oil burner is installed. A low pressure fan blast at from 3 to 4 oz. pressure is used for blowing into the combustion chamber the necessary air for combustion. Thus compressed air is needed only for atomizing the oil.

This scheme cuts down the amount of compressed air used and increases the efficiency of the fire. It enables the operator or fireman to completely control the nature of the fire by varying the quantity and pressure of the air blast for combustion. The oil and compressed air for atomizing it are regulated by one lever, and the ratio between the oil and the compressed air for atomizing always remains at a constant point, which has been found to be the best for complete atomization. The fireman or operator cannot make an inefficient or smoky fire, the regulation of the air blast varying only the nature of the fire from a soft and nonoxydizing flame to a hot concentrating fire.

Convenience.

Both the New York Central and the New York, New Haven & Hartford heating systems are simple to operate, and no extra men are required in the cab to operate them, this work being done by the engineer and fireman. It is obviously best that the safety of an entire passenger train should not be intrusted to but one motorman, and hence the practice of an engineer and fireman is continued, the above being part of the duty of the fireman.

A Montana Hydro-Electric Power Project.—An important hydro-electric power development is a project planned by the Capital City Power Company, Helena, Mont., which involves the construction of a multi-cellular concrete steel dam across the Missouri River near that place. The building of this dam, which will be 1500 ft. in length and have a 120 ft. head, is expected to furnish power to generate and transmit 30,000 hp. at 70,000 volts, three-phase, to the cities of Helena, Butte and Anaconda, and to mines and plants in their vicinity. In connection with this work there will be built about 40 miles of 70,000-volt transmission line. It is expected that work will be started early in the spring by the Capital City Improvement Company of Helena, which has the contract for construction of the dam. When completed the system will be operated in conjunction with the one now controlled and operated by the Missouri River Power Company. M. H. Gerry, Jr., is the chief engineer, and W. L. Miller is engineer in charge.

The Short Weight Conference at Philadelphia.—We have received a handsomely printed copy of the stenographer's report of the proceedings of the conference of representatives of the New England, Philadelphia and Pittsburg Foundrymen's associations and shippers and carriers of Pig iron, coal and coke, held at Philadelphia, February 5, for the purpose of endeavoring to eliminate the frequent claims of shortages in the delivery of pig iron, coke and coal. The proceedings cover 45 pages of printed matter, issued from the press of C. A. Hack & Son, Taunton, Mass. The gist of these proceedings was published in *The Iron Age* of February 13, pages 515 to 517.

The year 1908 brings the fiftieth anniversary of the opening of the first Atlantic cable over which messages were successfully sent. Tuesday, March 10, was the fifty-fourth anniversary of the signing, at Cyrus W. Field's house, in New York, of the contract to organize the first cable company.

Ore Shipments Not to Be Pushed.

DULUTH, MINN., March 13, 1908.—Ice conditions on the lakes are such as to promise little interference with the early opening of navigation, much to the regret of vesselmen, who would not be averse to any condition that would force a late opening. This, however, may be brought about by a general strike of the Seamen's Union, in which the great majority of men employed on lake vessels are members. There is little doubt that owners would welcome such a strike, and they are likely, under any conditions, to demand a change in union rules and a revision in wages for the coming season. They have been so long without control of their own ships that they may seize the chance to regain control of their property.

Curtailment of Production General.

There have been important conferences among Lake Superior mining men recently. The curtailment of production undertaken by some interests has now extended to all, and labor has become very plentiful on the various ranges. It is safe to state that underground mines, including those of the Steel Corporation, are not running to 50 per cent. of normal capacity. Some concerns, such as Corrigan, McKinney & Co. and the Republic Iron & Steel Company are lower than that. The former of these two is pretty nearly closed down on the old ranges, and its Mesaba operations are less than in years. Its big Stevenson, which has usually stripped steadily through the winter, is now down tight. The Republic Company is doing very little, and expects to make a production from underground materially below 50 per cent. It has some open pit mines from which the bulk of production will come. Pickands, Mather & Co. are carrying forward development on some difficult propositions, as usual, but in the way of stock piling and mining they are running slowly. Their proportion of the total is larger than that of most of the independents. The Cleveland-Cliffs Iron Company has cut off its night shift at several Marquette mines, and will fill its stock piles gradually. Its work at the new Gwinn District progresses steadily and without delay, but this is in the way of development, and there is no good reason why it should be suspended. These properties cannot at the best become considerable producers for some time. Ore sales have been less than in many years; indeed, it is reported that none of consequence have yet been closed. Furnacemen and steel makers evince no interest in the market.

A further diminution of employed miners is looked for shortly. It will come, doubtless, in the discharge of unmarried and independent men. Operators of the district have been in conference at various times of late, and expect more meetings. The lay off will have its effect on all ranges somewhat, though more severe on the Mesaba. On the Marquette range the Steel Corporation has cut off 25 per cent. of its men, and the hope is that no further reduction there will be required.

Mesaba Operations Will Keep Up.

While these conditions exist work on the ranges remains at a higher tide than would seem probable. The Steel Corporation's stripping operations are maintained in most cases on the even tenor of the plans. In this way the corporation is a steadying factor that is of the utmost value and consequence, and its effect in keeping men employed and the wheels of commerce and general business moving regularly is far greater than is appreciated by most people. The fact that Mesaba range properties are generally held under lease, and that these leases require certain annual payments on large tonnages annually will have a decided tendency to make the Mesaba a larger producer this year than ever, compared with the total from Lake Superior mines in general. And as the great minimum annual agreements of the Mesaba are chiefly on the large mines that can be worked open pit, the proportion of steam shovel ore will be greater than usual. This means, among other things, that the labor cost per ton of ore mined the coming year will be less than usual, and less than it may be in subsequent seasons, without reference to the maintenance of the wage scale.

The stripping of several of the large Mesaba properties, undertaken some time ago and on a plan for continued operation till certain areas shall have been made ready for mining, continues steadily. At its Sellers mine at Hibbing the corporation has been stripping since the close of 1906, and is still employing several shovels. It has made a pit large enough for the economical mining of several million tons of ore, and this pit reaches to within a few hundred feet of the center of the town of Hibbing, only 200 ft. from the large Centre School. Three shovels are at work in the Hull-Rust pit, on the other side of Hibbing, and a large section of the east side of the mine has been uncovered. This was the pit from which 2,900,000 tons of ore were taken last year, and the operations planned for the coming season, while not so large as that, will be enormous. For a long time drills have been testing the ore body on that part of this vast deposit not yet developed. As many as 12 drills have been at work at one time. It is the policy of the corporation to thoroughly explore its ore bodies before laying out a plan of development, and this work has been along that line.

Stripping at other large deposits at Hibbing has been suspended for the winter. These include the Pillsbury, which was being done by the Roberts-Kingston Company; the Stevenson and Morris, where the Drake & Stratton Company had eight shovels in the overburden; the Burt and Monroe, which was under a contract by Winston & Dear; the Mahoning, which was on company account, and the Hartley and Leonard, being done by the Steel Corporation. Most of these will be resumed in the spring, possibly on a considerably lessened scale of activity. A great deal of stripping by other operators in the Hibbing District is in contemplation, and while it may be somewhat delayed there will be a large amount of dirt moved the coming season, especially on that part of the Mesaba at and westerly from Virginia.

Operations in Other Districts.

Great difficulty is being experienced by the Rogers-Brown Ore Company in its work of sinking in the Cuyuna District, where it is putting down a three compartment shaft. This shaft, though under way since early last summer, has not yet reached ledge, and water conditions are occasionally such as to delay the sinking materially. Just at present the shaft is badly drowned by the inflow. There is little doubt that work on the Cuyuna is liable to suffer from this sort of thing indefinitely. Very little exploration is under way in the district, and the number of drills there is less than at any time within the past three years.

I have referred to explorations conducted in north central Minnesota west of Cuyuna, in Otter Tail County, where magnetic attractions were discovered, and invited attention after these attractions had been found on the Cuyuna to point to bodies of imperfectly concentrated iron ores. Still another field is now enlisting the attention of some pioneers in this field, and a line of attraction has been developed, lying in the southeast part of Hubbard County, Minn., about 75 miles northwest of the Cuyuna District. This has served to upset theories of amateur geologists, and some of them are now wondering if the whole of northern Minnesota may not become an iron mine. These Hubbard County explorations have not progressed very far, and it may be a long time before we are startled by the news of a new mining district.

The Breitung interests of Negaunee, are opening the old Baron mine at Humboldt, and will commence hoisting in a few weeks. The old shaft has been relined and rebuilt, a shaft house erected, machinery installed and the underground workings reopened and extended somewhat. Humboldt has been dead since the Bessie closed down, but the town is now showing some signs of life. The Baron will employ a considerable force if it is decided to go ahead heavily, but this decision can only come after a period of exploration. This mine was worked some 20 years ago and employed 300 to 400 men.

An important find of ore has been made in the Kinney

property at Spring Valley, Menominee range. A shaft is down 200 ft. and is all in ore, which came in some distance above, pitching from the south side. This ore is analyzed at better than 62 per cent. Another find has been made in the Waldron property, near Stambaugh, where the Brule Mining Company is exploring. Other developments in the same general district are most encouraging. D. E. W.

The Official Finding on the Quebec Bridge Collapse.

The Canadian Government Commission of Inquiry on the Quebec Bridge disaster made its report recently, and it was laid before Parliament at Ottawa, March 9. It is a voluminous document, but the conclusions of the commission are summarized in formal findings as follows:

(a) The collapse of the Quebec Bridge resulted from the failure of the lower chords in the anchor arm near the main pier. The failure of these chords was due to their defective design.

(b) The stresses that caused the failure were not due to abnormal weather conditions or accident, but were such as might be expected in the regular course of erection.

(c) The design of the chords that failed was made by P. L. Szlapka, the designing engineer of the Phœnix Bridge Company.

(d) This design was examined and officially approved by Theodore Cooper, consulting engineer of the Quebec Bridge & Railway Company.

(e) The failure cannot be attributed directly to any cause other than errors in judgment on the part of those two engineers.

(f) These errors of judgment cannot be attributed either to lack of common professional knowledge, to neglect of duty or to a desire to economize. The ability of the two engineers was tried in one of the most difficult professional problems of the day and proved to be insufficient for the task.

(g) We do not consider that the specifications for the work were satisfactory or sufficient, the unit stresses in particular being higher than any established by past practice. The specifications were accepted without protest by all interested.

(h) A grave error was made in assuming the dead load for the calculations at too low a value and not afterward revising this assumption. This error was of sufficient magnitude to have required the condemnation of the bridge, even if the details of the lower chords had been of sufficient strength, because, if the bridge had been completed as designed, the actual stresses would have been considerably greater than those permitted by the specifications. This erroneous assumption was made by Mr. Szlapka and accepted by Mr. Cooper, and tended to hasten the disaster.

(i) We do not believe that the fall of the bridge could have been prevented by any action that might have been taken after August 27, 1907. Any effort to brace or take down the structure would have been impracticable, owing to the manifest risk of human life involved.

(j) The loss of life on August 29, 1907, might have been prevented by the exercise of better judgment on the part of those in responsible charge of the work for the Quebec Bridge & Railway Company and for the Phœnix Bridge Company.

(k) The failure on the part of the Quebec Bridge & Railway Company to appoint an experienced bridge engineer to the position of chief engineer was a mistake. This resulted in a loose and inefficient supervision of all parts of the work on the part of the Quebec Bridge & Railway Company.

(l) The work done by the Phœnix Bridge Company in making the detail drawings and in planning and carrying out the erection, and by the Phœnix Iron Company in fabricating the material, was good and the steel used was of good quality. The serious defects were fundamental errors in design.

(m) No one connected with the general designing fully appreciated the magnitude of the work nor the insufficiency of the data upon which they were depending. The special experimental studies and investigations that were required to confirm the judgment of the designers were not made.

(n) The professional knowledge of the present day concerning the action of steel columns under load is not sufficient to enable engineers to economically design such structures as the Quebec Bridge. A bridge of the adopted span that will unquestionably be safe can be built, but in the present state of professional knowledge a considerably larger amount of metal would have to be used than might be required if our knowledge were more exact.

(o) The professional record of Mr. Cooper was such that his selection for the authoritative position that he occupied was warranted, and the complete confidence that was placed in his judgment by the officials of the Dominion Government, the Quebec Bridge & Railway Company and the Phœnix Bridge Company was deserved.

Quebec Bridge Losses.—The Quebec Bridge & Railway Company, which was organized to construct the Quebec Bridge, was capitalized at $1,000,000, of which but $48,700 was paid in in cash. In 1899, when the Parliament at Ottawa was asked to vote $1,000,000 to the project, the estimate of cost presented was $4,000,000. In 1903, when the question of guaranteeing the company's bonds came up in Parliament, it was estimated that the total cost would be $8,316,394. The liabilities of the company are $779,551, floating debt, and $5,561,507 borrowed from the Bank of Montreal on the guaranteed bonds, making $6,341,058 definitely known. In addition the Government gave the company powers of expropriation, which were exercised and will increase the liability on the part of the Government. The company had no insurance on the bridge, so that the loss is absolute.

The Westinghouse Machine Company, Pittsburgh, builder of the Roney mechanical stoker, reports for the first two months of this year a good demand for stoker equipment. Perhaps the most interesting orders have come from cold storage companies. The Merchants' Ice & Cold Storage Company, Cincinnati, is installing three equipments; Montgomery Ice & Cold Storage Company, Jenkintown, Pa., two equipments; Holt Ice & Cold Storage Company, Indianapolis, Ind., the same number. Another municipal lighting station at Troy, Ohio, operated by the Board of Public Service, has adopted Roney stokers, and the Pennsylvania Light, Heat & Power Company, Allegheny, Pa., operating a large central station at that place, increases its present equipment with two stokers of large capacity. The Mutual Union Brewing Company, Aliquippa, Pa., is installing three equipments, and the Alpha Portland Cement Company, operating a number of plants in the country, one of the largest size.

The *General Electric Review*, which has been published for the last five years by the General Electric Company, Schenectady, N. Y., for distribution within its own organization, is now being offered for general circulation at a subscription price of $2 per year. It is the intention to make the paper of value and interest to those engaged in the electrical industry, but particularly those having to do with lighting, power and railroad work, and new and interesting developments in these fields will be treated by authorities from time to time as they appear. It is also the intention to make it a medium for presenting the latest, most novel, and useful types of apparatus, devices and supplies applicable to lighting, power and railroad work.

Germany's naval estimate for 1908 provides for nine new battleships, four armored cruisers, six small cruisers, 24 destroyers and seven submarines. Two of the battleships are of 13,000 tons each and are practically ready, as are two of the armored cruisers. Seven battleships are to be laid down in 1908, having a displacement of 18,500 tons each.

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The New Salesmanship in Iron and Steel.

Comment has already been made in these columns on the increased efficiency of workmen apparent in many industries since the decline in trade reversed the order of last year and made men much more numerous than jobs. The phenomenon is only natural, but the transition from one condition to the other has been rapid. There are shirks and incompetents in every body of workmen; they especially flourish in boom times. They are the first to be dropped when work falls off. Then an unusual competition sets in—competition to hold such jobs as remain.

Perhaps fully as marked a change as this in the operating department, though of a different sort, has come over the sales department. So far as iron and steel salesmen are concerned no other business recession has brought conditions such as have prevailed in the past four or five months. It is no new experience for a seller of finished steel products to compete sharply for orders, and in other times of slack demand the hunt for business has been enlivened now and then by savage slashing of prices when particularly desirable contracts were given out. To-day the salesman, with a hungry mill and an anxious general manager of sales behind him, needs to be master of the fine art of getting business without cutting prices. Going back to the crowded months of 1907, we will see that what has just been referred to is not the only hard problem that has taxed the resources of the salesman in the remarkable year we have passed through. For many months his functions had been largely those of a diplomat and intercessor. On the one hand it was his task to placate his friend, the buyer, who, in turn, with customers besieging him from every direction, was compelled each day to put a new touch on the threadbare story of the wicked mills that had taken more orders than they could possibly fill. On the other hand was the salesman's home office, whose distractions were his daily food and drink. In the intervals of pleas for early shipments of material due his more violent customers, he felt it his duty to say to headquarters, in terms both respectful and convincing, that the day would yet come when he would have to hunt hard for orders, and then buyers with good memories and a grievance would rise up to plague him.

Suddenly—it was like a change over night—the salesman found that the bulk of his correspondence was with the credit department. Between the customers who stopped shipments and those to whom the mill ceased to ship, for reasons of prudence, the order department was *functus officio*. It was a strange experience for the salesman, who had long been adding his pleas to those of the buyer to persuade the mill to get out material, now to add his tact to that of the credit department to accelerate transmission in the opposite direction. It was doubtless the most trying of all his varied activities. The unpleasant duty was done heroically, but with the stout mental reservation that the functions of collector and salesman ought to be unalterably divorced.

Since the opening of the year the salesman has been a salesman again. The serious, almost pained, look that went with the discussions of finance in his customers' offices just following October has disappeared from his face and the light of orders yet to come is in its place. The brute argument of a lower price than that of the competitor last on the ground has found various substitutes. No influence is too high to invoke, if it will help gain an order. Friendship, collateral trade relations, and considerations that under ordinary conditions would never be urged, are now being made use of to get orders on the books at "the going price." General managers of sales and even presidents are showing a concern about business from their smaller customers that they could not be expected to entertain in normal times. The fact that a few months ago it was not considered desirable to make shipments to many of these same customers is no longer to the point. Seller and consumer are willing to forget all that. Moreover, if it appears that some things that happened to deliveries in the stress of 1906 and most of 1907 are now operating to the detriment of the seller, there are also evidences that special exertions to meet emergencies then are findng proper recognition from buyers now. Undeniably it is a situation in which precedents are not specially useful and one whose difficulties call for the highest order of salesmanship.

The Dingley Tariff's Long Life.

Attention has been called to the fact that the present tariff law, known as the Dingley Tariff law, has been in effect longer than any previous customs law. The tariff of next longest duration was the Walker tariff, which became effective December 1, 1846, and was not superseded for 10 years and 216 days. The Dingley tariff became effective July 24, 1897, and therefore attained the age of the Walker tariff last month. From present indications it is not likely to be amended or displaced for some considerable time, so that it seems destined to make a conspicuous record for longevity. That the Dingley tariff has retained its place among active statutes so long is not because it more nearly approaches the ideal tariff than any of its predecessors, nor because it was laid down on such scientific or symmetrical lines that it was incapable of amendment without absolute reconstruction. It owes its immunity from changes to fortuitous circumstances. Not since its enactment have tariff revisionists or reformers secured sufficient power in Congress to enable them to make an effective attack on it for the purpose of generally reducing duties. Attempts have been made to work up a sentiment in favor of modifying some of the schedules which the lapse of time and commercial changes have made desirable to certain domestic interests, but all movements of that kind have received no encouragement from those who have been and are influential in directing national legislation. The fear of precipitating a general tariff revision, with its accompanying interruption to business, has always operated as a deterrent. With very brief interruptions, the period covered by the Dingley law has been one of abounding prosperity, and to interpose so serious a check to business as a gen-

eral tariff revision would have been to endanger political supremacy from which the boldest leaders of the dominant party might well shrink.

It is unfortunate that, under our system of legislation, changes in our revenue laws cannot be made without upsetting business. The process of revision is usually long drawn out, a period of months elapsing between the time when the Ways and Means Committee of the House of Representatives begins the preparation of a tariff bill and the final agreement by both Houses of Congress on a set of schedules to be submitted for the signature of the President. Meanwhile enterprise halts, business languishes and capital consumes itself for lack of remunerative employment. This method of accomplishing a revision of the tariff seems to be irrevocably fastened upon us. Congress does not take kindly to the proposition of a tariff commission or the often suggested creation of a body clothed with the duty of making or recommending changes in duties whenever new business conditions make such changes seem desirable. The same slow process, the same agonizing interference with the orderly procedure of current business, must continue to mark every revision of the tariff.

With this practice unchangeably fastened upon us, it would seem to be wise for those who are intrusted with the responsibility of making or revising our laws to attempt no revision of the tariff during a season of trade activity, but if a revision is really necessary, take it in hand in a time of depression like the present. Existing conditions could not be made worse, as buying is only being done for immediate needs. Individual enterprise would not be interfered with, as apparently all enterprise has halted to await further developments politically or financially. If it should be found expedient or desirable to reduce duties on some classes of merchandise, and such action should correspondingly lower domestic values, the shrinkage to the merchant or the manufacturing consumer would be relatively small, as stocks of merchandise are probably as low as they ever will be. A revised tariff could be put in effect under these circumstances with far less shock to the country and much less loss to the interests adversely affected than at any other time. This, however, is not to be done. The country is advised that a revision is surely to be made, but not until after the Presidential election. By that time, we all fervently hope, the effects of the panic will have worn off and the country will be well on the way to another era of prosperity. Should that prove to be the case, it may reasonably be expected that, unless tariff reformers shall have overturned the party in power, a demand too strong to be ignored will be made by business interests to let the tariff question alone. He would be a rash man indeed who at such a time would interpose so serious a check to the country's recovery as tariff agitation. The Dingley tariff may be destined to live until it is revised by its enemies, instead of its friends, as now promised.

That the very favorable condition of our foreign trade continues is shown by the February statistics of imports and exports. The excess of the value of merchandise exports over imports for that month totaled the huge sum of $88,743,361. The excess for the corresponding month of 1907 was only $36,511,538. The excess of exports for the eight months ending with February was $520,889,724. The excess for the corresponding period of the previous fiscal year was $356,480,012. The exports of merchandise for February were $167,867,762, the largest ever reported for the month of February, while the imports were only $79,124,401. For February, 1907, the imports of merchandise had reached a value of $123,005,683. These figures indicate not only the retention here of the heavy gold imports of last fall, but also the possibility of further imports to cover the trade balance now running so strongly in favor of this country.

Workmen's Rewards for Suggestions.

A writer in one of the English engineering journals, in discussing the relations of producer and user in the development of machinery, makes this statement: "Many workmen, especially where their observation is suitably encouraged, are as likely to contribute to efficiency of design as draftsmen; their experience is direct, practical and intimate. No reading of a drawing, however perfect, can compare with the constant study of the actual machine in operation, or of the growth of any given product. Some trained mechanics have considerable capacity for reflection, and then, during machinery operations, ideas are more likely to develop than is the case with draftsmen isolated from manufacturing processes. This must materially affect those parts in the design which are influenced by machining operations, and which undoubtedly affect not only economy of manufacturing, but of the accessibility of parts of the product."

We believe that in most American industrial establishments the workman is given little substantial encouragement to apply his mind toward improvements in the design of machinery and processes. To carry out such a plan is no easy proposition. A few works have adopted elaborate systems of premiums for ideas, either on a competitive basis, or on one in which the worth of the suggestion determines the reward. But in the ordinary manufacturing plant this form of encouragement of a workman is not a simple matter. If he is an operative, his worth must be reckoned on his producing capacity rather than on an occasional suggestion that the drafting room will work up later. His invention of an improvement on a machine tool would not necessarily justify an advance in his wages; in fact, in many cases it would really afford no ground for it. Perhaps a money reward, an unsolicited present, in recognition of a valuable idea would be as potent a stimulus as anything. The personal equation of the workman would always be important in this connection; there are plenty of men who spoil easily under praise or reward, and their notion of their own worth increases out of proportion to reality. It is easy to imagine a capable workman whose value has been actually impaired because of exaggerated egotism wrought by the finding of an extra banknote in his pay envelope. In some shops the existence of labor complications might render such a practice unwise. The likelihood of engendering jealousy is another consideration. Then, again, the employer may feel that suggestions constitute a part of the work for which his men are paid, and that their reward lies in their wages.

On the other hand, it is not at all uncommon to hear of the complaint of a workman that no recognition has been taken of a suggestion, the value of which has been evidenced by its adoption. He feels hurt; he has not been appreciated; the drafting room has taken credit for his idea; he should have some return for the value received from him. The next time he has an idea he may keep it to himself. He may become a less valuable man than he would have been if the idea had not entered his brain.

It is an undisputed fact that few machines are designed on paper that do not require radical changes from their first model. And the design of no machine, no matter how perfect, can be permitted to stand still. Constant

improvement must be made in order to meet competition.

The English writer states that the man operating a machine is in the best position of all to see opportunities for improvement. Probably, however, the most efficient man in this connection would be the trained designer who takes the time to act as an operator under commercial conditions. This idea is carried out to a certain extent. The designer spends as much time as possible in the shop, keeping in close touch with the machine upon the improvement of which he is working. He should have full knowledge of the criticism of customers and the weaknesses which result in excessive repairs, and with improvements in competing machines. In most modern establishments special pains are taken that this knowledge is provided. There is a growing tendency to give the engineer a practical knowledge of his specialty in its practical operation. As an illustration of this, some foreign ship builders are sending young engineers, and occasionally an expert, on cruises, that they may study various questions under service conditions. The drafting room is recruiting from the shop whenever genius for design is shown by young mechanics, and such a man has advantages over his associates who are trained exclusively at the drawing board and in the books. But no matter how skillful the machine designer, no matter what pains he may take to study his subject, or what his training has been, the mechanic in the home shop or that of some other user of the tool will continue to give valuable suggestion in design, and to encourage him judiciously may mean the realization of important advantages over competitors.

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It is universally asserted that the pig is a "contrary animal," and that pig iron is like unto it; certainly there would appear to be some foundation for the latter statement, for we frequently find that pig iron prices rise when every one is expecting them to be on the down grade, and *vice versa*. An instance of the value of pig iron advancing when everything would indicate that it should be decreasing is afforded in the Cleveland District at the present moment. The position is a peculiar and practically unique one, such as probably has not come within the experience of the present generation of those who are engaged in the iron and steel industries. Everywhere else trade is depressed, and locally the finished branches of the iron and steel trades are in a very unsatisfactory position. Yet in the face of that the Cleveland pig iron industry is in a most excellent condition, and the deliveries are in excess of the production. Indeed, the demand from consumers is keener than the makers can satisfy, so that the balance of demand which they are unable to supply has to be obtained from the stock in the public stores.

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The pig iron trade of northeastern England is now as busy as one ever finds it at this period of the year. Undoubtedly it is a curious if not altogether unprecedented position of affairs to see the demand for, and prices of raw materials improving steadily at the same time that the sale of the finished materials falls off, with prices for the latter on the move downward. From all quarters reports of dullness and depression in the metallurgical industries were received last month, yet the Cleveland ironmasters were called upon to ship over 130,000 tons of pig iron, a quantity greatly in excess of anything dispatched in any previous February; indeed, the best return for the second month of any year was last month exceeded by 11 per cent., and there was sent away 60 per cent. more than the average of February over the last 10 years. Never, perhaps, has it been so difficult at this season of the year to get pig iron from the Cleveland ironmasters for shipment, and it became necessary last month to draw so much iron out of Connal's public stores to assist in satisfying the requirements of consumers that the public stock declined 12,474 tons, which was in contrast with an increase of 11,324 tons in the month of January. Besides this the makers are reported to have exhausted their own stocks, and it became almost as hard last mouth to get prompt deliveries of Cleveland iron as it is in the hight of the regular shipping season in really good times.

The March figures are even more favorable for the producers of Cleveland iron than those of last month were, and the trend of prices is upward, while those of the finished article are on the decline. At the commencement of last month No. 3 Cleveland pig iron was sold at 48 shillings per ton; now 50 shillings 9 pence is the least that will be accepted for it. Any changes that have been made in the quotations for finished iron and steel have invariably been in a downward direction. Indubitably the position is most unexpected, and the majority of traders would have hardly counted it possible for such a state of affairs to exist. It is not easy fully to account for what must be described as the extraordinary activity of the Cleveland pig iron trade at the present time, when apparently such a state of affairs is not justified by the position of the industries that consume that commodity.

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It was my fortune to be connected for several years with a manufactory whose product was chiefly made in its iron foundry and whose lines were of such staple character that only by the closest attention to detail could they be manufactured and sold with a certainty that the market prices were bringing a profit. Shortly afterward I was invited to take charge of a plant manufacturing patented specialties, and whose manager was very emphatic in his assertions that he desired no cost records. To quote his own expressions:

"I don't give a hoot what any of my goods cost. I am making several hundred per cent. profit. This is a close corporation; I have no reports to make to a Board of Directors, and as long as my bank balance shows gain I don't need to know whether any particular item I make costs me 3 cents of $3. When competition creeps in and I am unable to name my own prices, then it will be time enough to figure costs."

These two cases are extremes and aptly illustrate the fact that the necessities of the case will influence the degree of refinement to which cost keeping will be carried.

The Cost of Melting Per Article Made.

There is one factor in foundry cost keeping, especially in the manufacture in quantities of the smaller castings, that does not usually get the attention it deserves—that is, the cost of melting per article produced, and it is my purpose in this article to show the influence of this factor on costs.

The establishment I have under consideration manufactured a varied line of stove and builders' hardware. Two items which were extensively made were stove pipe dampers and Mrs. Potts' sadirons, for both of which lines contracts were taken in car lots. These two articles represent the extremes of the proportion of remelt. The stove pipe dampers being cast as light as possible, the proportion of gate and sprue to weight of finished casting was greatly in excess, and after adding the broken castings from the cleaning, assembling and shipping rooms the result showed that, for every 100 lb. of dampers shipped, approximately 250 lb. of iron was melted. The sadirons, on the other hand, being much more bulky and having a less proportionate loss of completed castings, averaged about 150 lb. of iron melted per 100 lb. of castings shipped.

To show what this means in money to the respective lines, I will add that the average of the entire foundry melt equaled 50 per cent. new iron and 50 per cent. remelt, so that in figuring on the old basis the cost for melting iron for each 100 lb. shipped was the same in both cases, thus misleading the cost figures on each item by the cost of melting iron for the number of pounds melted over or under the average.

Charges Made Against the Weight Produced.

The cost of melting iron was obtained by charging all cupola labor, fuel, material, power, &c., against the total weight of iron produced. This factor was kept entirely distinct from the cost of the iron itself, being considered strictly as a manufacturing operation, and in round figures amounted to 35 cents per 100 lb. of melted iron.

Now we will assume a carload of dampers to include 30,000 lb. of iron castings, to make which there was melted 75,000 lb. of iron at 35 cents per 100 lb., or $262.50 for cost of melting, which, if figured on the average basis of 60,000 lb. melted per car, would show a cost of $210 for melting, or misleading us by $52.50 per car, and on a commodity subject to as sharp competition as this article, might mean getting business at too small a profit, if figured in the old way.

On the other hand, a carload of sadirons, containing also 30,000 lb. of castings, required but 45,000 lb. of iron to be melted, or cost for melting only $157.50, against the average figure of $210, or $52.50 per car less than if figured without a knowledge of the actual weight of iron melted for each article made.

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It is obvious that concerns whose product is the most varied and whose proportion of remelt is greatest can profit the most from a study of this factor in foundry costs. On heavy work in which remelt is insignificant, or in which the foundry element is a small portion of their total costs, it would scarcely be worth while to check the weight of metal melted per each article produced, although it is generally considered good policy to know what it costs to melt iron as a separate factor from the cost of molding, even where the pound cost of castings is sufficiently accurate, as it enables economies to be effected that might otherwise be neglected.

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The Eight-Hour Bill Hearing.

A Notable Demonstration Before House Committee on Labor.

WASHINGTON, D. C., March 17, 1908. The House Committee on Labor the past week has heard protests against the pending Eight-Hour bill from representatives of leading steel manufacturers, shipbuilders, bridgebuilders, structural iron and steel erectors, and other manufacturers in the metal trades. Without an exception these witnesses have denounced the pending measure as exceedingly mischievous, and the majority have declared frankly that should it become a law they would thereafter refrain from competing on Government business under any and all circumstances. Never before in the history of the movement for the enactment of a national Eight-Hour law have the protests against the measure been so urgent, a fact which is, perhaps, significant of the somewhat unsettled conditions now prevailing, which emphasize the danger of experimental legislation of any kind.

The testimony presented to the committee would fill several complete issues of *The Iron Age*, but the following brief synopsis of the evidence of a few of the more important witnesses will indicate the character of the opposition to the Eight-Hour bill, and will, no doubt, be read with interest:

From the Steel Makers' Standpoint.

EUGENE C. GRACE, general superintendent of the Bethlehem Steel Company: We have operations in the melting of special steels in the open hearth furnaces which absolutely require the personal attention of one individual from the start of the heat to its completion. One of my first experiences with my company was in the employment for some time in our open hearth department, and I had direct charge of the making of the higher class of steel for armor plate work and gun work. It was my duty, and it was of necessity, to follow in all stages of manufacture the heat required for the making of an armor plate ingot. If that heat was tapped at 2 o'clock in the morning or 4 o'clock in the afternoon, I was on duty to see that heat tapped. There is an element of personality, necessarily, in knowing the action of that furnace from its original charge until the final tap of the steel. I could not go to my relief and give him certain conditions existing in that bath to the best of my knowledge. I could not impart what I would know of the internal workings of that bath to him. We have found it possible to, and do on the ordinary class of steel, change shifts, where the composition is of no import; but where the composition is of such character, and there is so much at stake, representing our largest ingots, 300,000 lb. of steel, nickel and chromium, you certainly would not take chances that you would in the case of steel of lower grade, where you do find it possible to employ two or more shifts of men in carrying out the operation.

We take a contract for 12-in. finished guns, which are not accepted until they have been proof fired by the Government, and then they are put in service on a battleship or a land battery. It is a very difficult operation of machining, as you can all imagine, in the making of a gun of the larger type which is built up of in the neighborhood of eight to nine large hoops, starting from the original tube and being built up with hoops shrunk one on top of the other, making a complete gun. Each one of these surfaces has to be of the accuracy of a half of a thousandth of an inch, and an inaccuracy of that dimension will cause the condemnation of the forging or the piece that is being worked on, and I think you can all appreciate the necessity of having those measurements taken and having a particular operation executed from its inception to its completion by one individual.

I have in mind at this time what happened to a mechanic in our plant not more than two or three months ago, where, for some particular reason, the Government was anxious and was urging that a certain large gun tube should be completed, where we were compelled to change the individual on a particular operation. One man was taken ill, and we placed another man on the operation and we lost the tube, valued at in the neighborhood of $15,000. It is absolutely necessary, from our point of view and from our experience in the manufacture of ordnance material requiring such a degree of accuracy, that the conception of those operations, their measuring and machine cutting, the operation of that machine, must be carried through by the one man. The temperament of the man, the accuracy of the measurements, must be all considered. When you consider that you are measuring with a micrometer to the accuracy of half a thousandth of an inch, Mr. Jones and Mr. Smith will certainly vary more than that in their way of looking at the micrometer.

Could Not Take Government Work.

ANDREW M. MORRISON, of the Pennsylvania Steel Company: In looking over the bill and reading it very carefully, I find that it would be impossible for us to bid on Government work under those requirements. To reduce the ore to pig iron, you have to use a blast furnace running continually. The metal is drawn from the blast furnace and taken over into the open hearth furnaces, and the steel does not get cold until it reaches the finished state, or the structural materials or rails, whichever it might be, so that it would be absolutely impossible for us to run a steel plant on an 8-hr. basis. In addition to that we manufacture steel castings, iron castings, frogs, switches, structural material for bridges and so on, and take large contracts for the manufacture and erection of both bridges and buildings, and we have done quite a little work for the Government.

Taking this bill, for instance, on the structural part of the work, where we would have a contract for furnishing a Government building, we employ in our structural department, say 1000 men. It is necessary to run that shop economically, to run certain parts of it both day and night in order to relieve the congestion. The other part of the shop we run simply on a 10-hr. basis. The Government work represents a very small percentage of our actual output, and it would be impossible for us to take that work, classify it in the shop, and keep the hours of the men different on the several grades of work. In addition to that, where we do take a contract, it is necessary for us to go out in the open market to buy certain things which we do not produce, such as stone and building material of various qualities, and this bill makes it obligatory on our part to see that they do not violate the Eight-Hour law, which would be impossible for us to do.

F. S. Chavaunes, of the Central Iron & Steel Company, entered his protest along the same lines.

The Opposition of Shipbuilders.

Harry W. Hand and Joseph W. Powell, officers of the Cramp Ship & Engine Building Company, W. G. Randle of the New York Shipbuilding Company and John A. McGregor, president of the Union Iron Works, presented arguments against the bill from the standpoint of shipbuilders, and all of them showed that it would be practically impossible to engage in Government work if the provisions of the bill should become law. Their statements were emphasized and reinforced by arguments made by James H. Mull, general superintendent, William H. Glocker, shop superintendent, and John F. Keen, foreman of the shipwright department of the Cramp Company. Mr. Powell gave the following interesting instance of the manner in which Government work and private work are conducted side by side in the shops of his company:

Any one going into our machine shops to-day would see near the door a large hydraulic turbine that is being built for the Canadian Copper Company. Next to that are the bedplates for the South Carolina's engines, and the engines themselves in course of erection. Next are the bedplates for the engine for a merchant ship, and beyond are various parts of the engine for a side wheeler. Then there are the casings for some water turbines, and beyond is the turret track for the South Carolina in process of machining. On the sides of the shop there are a number of hydraulic pumps for various purposes, and possibly parts of sugar apparatus for Cuba or for Porto Rico.

I think it will be conceded that this shop must either run on the 8 or the 10 hr. basis, and I think it will also be conceded that if it was on the 8-hr. basis it would be at the 10-hr. pay. That would mean an immediate increased cost of labor of 20 per cent. at the present time. In our foreign turbine work for Canada we are practically on an even basis with the Swiss and the Germans, in so far as duties are concerned, and we have been able to do a very large proportion of all this work that the Canadians have purchased. With the extra cost entailed by putting these shops on an 8-hr. basis we would simply have to give up either the Government work or this lucrative export trade.

Other Interests in Opposition.

Speaking for the bridge-builders and building erectors, Robert J. Davis of the American Bridge Company, H. D. Bush of the Baltimore Bridge Company, James Baird of the George A. Fuller Company, James B. Kelley of the Thompson-Starrett Company and W. C. Post of Post & McCord, all gave most emphatic reasons why their interests were opposed to the bill. Francis J. Tucker of the South Chester Tube Company made an argument both from the standpoint of a workingman and of a manufacturer, he having had experience in both capacities. William H. Matthai of the National Enameling & Stamp-

ing Company stated that his company is manufacturing goods for the Government to a limited extent. It is but a small proportion of the company's business, however, and if it was necessary to comply with such a law as laid down in this bill the company would be prevented from making any goods whatever for the Government.

W. L. C.

The Pittsburgh Manufacturers' Association.

The fifth annual meeting and dinner of the Manufacturers' Association of Pittsburgh was held in the banquet hall of the Duquesne Hotel, Pittsburgh, on the evening of March 13. Despite a heavy downpour of rain there was an excellent turnout, 96 people being seated. After the serving of the dinner the meeting was called to order by President F. H. Zimmers, who spoke in part as follows:

The past year has been a good illustration of organization. It has shown us conclusively the value of co-operation, and I think we have learned some lessons we will not forget soon. It has also established our standing and position among our workmen, as to our ability to resist unjust demands. It requires backbone, and plenty of it, to practically shut your shops down with more orders and contracts than you can fill, and this was the position of our members whose machinists struck last April. What can we do to impress on our friends who are outside of this association what we have accomplished, and what more we could do if they would join us and help us in completing an organization which stands "for the good of all?"

The labor unions can teach us a lesson in this respect and certainly have done so. There are in the neighborhood of 50 to 60 firms and corporations in our city who should be members of the Manufacturers' Association and join us in this work and take their share of the burden. Our Labor Bureau in itself will amply repay the cost in selecting competent men who make application for work, and through this means can be identified and their records looked up. It saves the time and cost of trying out incompetent men.

We, as manufacturers of Pittsburgh and vicinity, must wake up. We have strong competition, and plenty of it, and it is only through co-operation among ourselves that we can keep the price of labor at the point that will permit us to compete successfully with outside places. With the aid of our two national associations, the National Founders' Association and the National Metal Trades' Association, we have the co-operation and financial assistance of some 2000 firms and corporations in the United States and Canada. With this bulwark of strength behind us, why should we not stand up for what is fair and right—the right to operate our own shops in our own way? Nor do we mean by this that we have any quarrel with labor. Their interests and ours are identical. What is good for them is good for us. We have some good friends with us to-night who will speak more fully on this subject.

I think we can be proud of the gentlemen who have given their time and attention to this association in the past. I refer to our past presidents, Mesta, McFadden, Shaw and Heyl, and our old war horse, Isaac W. Frank, and also to our counselors and officers and to the good members who have always been ready with their advice and assistance when called on. I congratulate the members of this association on the work they have accomplished, and trust that they will further cement the ties of friendship and good feeling for each other, and that we will be able to convince our friends on the outside that the Manufacturers' Association is a good thing and we are proud to belong to it.

President Zimmers then introduced M. C. Rinehart of the Pittsburgh White Metal Company, the toastmaster of the evening. A. E. McClintock, commissioner of the National Founders' Association, presented interesting information on the working of that organization. Robert Wuest, commissioner of the National Metal Trades Association, called special attention to its labor bureau and the benefits to be derived by its members. He cited a number of cases in which this bureau proved of valuable assistance, and stated that it would be well worth while for manufacturers not now members to affiliate themselves with the association. Isaac W. Frank of the United Engineering & Foundry Company, Pittsburgh, and John A. Penton of the Penton Publishing Company, Cleveland, were also among the speakers. The Executive Committee of the Manufacturers' Association of Pittsburgh consists of the following: F. H. Zimmers, Union Foundry & Machine Company; Wm. H. Hamilton, Rosedale Foundry & Machine Company; Biddle Arthurs, Simonds Mfg. Company; F. W. Gerdes, Hall Steam Pump Company; W. J. Carlin, Thomas Carlin's Sons Company; C. C. Smith, Union Steel Casting Company; Thomas Fawcus, Fawcus Machine Company. Walter B. Averman is secretary.

Pipe Freight Rates to the Pacific Coast.

An interesting situation has developed on the Pacific Coast in relation to transcontinental freight rates on cast iron and steel pipe. The terminal rates at present are the same per ton on both kinds of pipe, and the cast iron pipe manufacturers feel that the railroads should make a difference in their favor of at least 15 cents per 100 lb. They give as their reason for asking that a difference be made that cast iron is a more crude or less refined metal than steel. The plea which they have made before the Transcontinental Association for a reduced rate is substantially as follows:

"The value of any article is a consideration in the making of rates. Cast iron pipe is made by melting pig iron in a cupola and pouring it into molds, the process of manufacture being a comparatively simple one, which does not noticeably change the character of the metal. The value of the pig iron is increased only by the labor cost and cost of melting, &c., and to so slight an extent that there is no article made from remelted pig iron so cheap per ton as cast iron pipe.

"In the case of steel pipe, the pig iron is converted into steel by the Bessemer or open hearth process, involving a large amount of invested capital for converters and equipment, and is refined, losing in its finished state by the burning out of some of its elements some little of its original weight. The process makes a homogeneous metal, of an increased tensile strength of about 300 per cent. This steel is poured into ingots and rolled into sheets of suitable size and thickness, trimmed, then welded into tubing by special and expensive machinery, the ends cut off and threaded, after which it is ready for the market.

"Pipe made from steel, on account of its tensile strength, is made much thinner than cast iron, and weighs much less per foot. The freight rates being on a per ton basis, it will readily be seen that the freight charges per foot on cast pipe will be much greater. The actual difference is so great that the steel pipe manufacturers have been able to sell their product on the Coast at a much less figure than cast iron pipe can be sold, even though the basis at the mill is reversed. In the case of water works and gas works extensions a great deal of business legitimately belonging to the cast iron pipe manufacturers has been taken away from them. It is claimed by the cast iron pipe interests that the business referred to would be theirs, if the rate adjustment asked for was ganted."

This matter of adjustment of rates has been brought before the Transcontinental Freight Bureau, but so far as is known no definite action has been taken. An advocate of the differential says: "The steel pipe interests naturally oppose the granting of a differential in rates, and the railroads find it difficult to make the adjustment because they think the present rate is a low one, and the only way out of it would be to raise the rate on steel pipe. It is almost an impossibility to raise rates when once they are lowered, even though this case would seem to demand its being done. The advantage realized by the railroads will be the increased tonnage they will haul, for the same footage, in case a differential is made in favor of cast iron pipe. The railroads also realize that their revenue will greatly increase if the steel pipe rates are raised, because the greater part of the steel pipe tonnage sold does not compete at all with cast iron pipe, and the additional amount of freight on such pipe would be clear gain."

This matter has been before the Transcontinental Association more than a year, and arguments were made by the interested pipe manufacturers in Chicago a few months ago. There are no indications at present that a change in the rates is to be made. It is said that, if the railroads are unable to make the differential asked for, it is probable the matter will finally come before the Interstate Commerce Commission for a ruling.

The Cambria Steel Company's Report.

The income account of the Cambria Steel Company for the year ending December 31, 1907, is as follows:

Net earnings from operations		$3,888,199.39
Receipts from rents, investments, interest on bank accounts, profit on ore sold, &c. (Of this amount $602,743.90 was due to profits from subsidiary ore mining and lake transportation companies, and $301,649.78 to profit on surplus ore sold)		1,094,754.91
Total		$4,982,954.30
Fixed charges under Cambria Iron Company lease and incidentals		420,687.58
Net income		$4,562,266.72
Which has been appropriated as follows:		
Dividends	$1,350,000	
Set aside to betterment and improvement account	2,400,000	
Set aside to general depreciation fund	500,000	
Set aside to inventory depreciation fund	300,000	
		4,550,000.00
Balance carried to credit of profit and loss account		$12,266.72
The profit and loss account, which had a credit December 31, 1906, of		$2,357,227.41
Has been increased by balance of income account transferred as above		12,266.72
Total		$2,369,494.13
And reduced by bad or doubtful accounts in 1907	$49,361.03	
Less collection of accounts charged off in previous years	36,085.33	
		13,275.70
Leaving balance to credit of profit and loss account, December 31, 1907		$2,356,218.43

The general balance sheet as of December 31, 1907, is as follows:

Assets.

Property, works, coal, ore lands, &c., subject to payment of $338,720 annual rental, under Cambria Iron Company lease		$33,090,304.68
Plant additions to Dec. 31, 1906	$9,317,479.38	
Plant additions year ending Dec. 31, 1907	1,986,017.37	
		11,303,496.75
Total		$44,393,801.43
Equipment additions		888,090.25
Real estate, titles in Cambria Steel Company		326,462.02
Sundry securities, principally stock in ore and steamship companies		1,518,638.00
Inventory account, materials, supplies and products		7,192,231.97
Special deposit	$1,000,000.00	
Cash	1,186,517.65	
		2,186,517.65
Accounts receivable		5,070,589.80
Bills receivable		678,420.56
Total		$62,254,751.68

Liabilities.

Capital stock issued	$45,000,000.00
General depreciation fund	3,150,000.00
Inventory depreciation fund*	300,000.00
Betterment and improvement fund	9,400,000.00
Accounts payable, including dividend No. 13, $675,000	2,048,533.25
Profit and loss account	2,356,218.43
Total	$62,254,751.68

* The supply of iron ores is provided from the Lake Superior District; to insure continuous operation of plants, heavy stocks are carried at this season of the year. Due to the prevailing stagnation in business these are not being marketed as rapidly as usual, and it is deemed prudent to protect the probable depreciation by this account.

From the accompanying statement by President Powell Stackhouse and Chairman E. B. Morris, the following details are taken:

Mineral Properties.

The coal, iron ore and limestone properties owned produced satisfactory results. Explorations for ore are being continued on a large body of land in Michigan held under option, thus far with negative results. The Penn Iron Mining Company shipped from its mines on the Menominee range, Michigan, 378,764 tons of iron ore for use at Cambria Works. The Republic Iron Company of Michigan, of which the Cambria Steel Company owns over 99½ per cent. of the capital stock, shipped from its mines in the Marquette District, Michigan, 171,048 tons of iron ore, about 150,000 tons for use, the remainder having been sold.

The Mahoning Ore & Steel Company, Mesaba District, Minnesota, of which the Cambria Steel Company owns 50 per cent. of the capital stock, produced 1,547,711 tons or iron ore, Cambria's proportion of which was 692,-107 tons; 515,000 tons for use and 177,000 tons were sold at a profit. Its annual output can be increased, when required, and its ore reserves are ample for a very long term of years.

Cambria Plant.

Expenditures aggregating a large sum have been made at many points in the original works, in the line of remodeling and betterments. The chief of these are: The steel stock bins at Nos. 5 and 6 blast furnaces; one-half of these are now in use and the balance should be completed in the first half of 1908. The new and enlarged fireproof machine shop which is finished and operative; the placing of a few new tools and rearranging of tools now in use remain to be done.

There is being added 2000-kw. electric power with 2400-hp. boilers at No. 6 blast furnace. The use of this convenient and for many uses economical power is constantly increasing in all parts of the plant. A repair shop, with special tools, is under construction for this department.

Gautier Plant.

The 22-in. plate and breakdown mill under construction last year commenced rolling steel in September. The boilers of this department were consolidated in one building, gaining room at a point badly congested, and economy in operation.

Two 75-ft. spans of steel and concrete construction have replaced an equal width but a less length of the temporary wooden buildings erected in 1889. After the rebuilding and removal of the 20-in. plate mill into the new building, and as opportunity offers, the work of reconstruction will be proceeded with until all the old buildings are replaced.

Franklin Plant.

The work that has been carried on during the year has been in the direction of the completion of the plant in accordance with the plans contemplated when originally designed.

The Franklin mines, furnishing the coal supply for the Otto Hoffman ovens, have been equipped with an electric haulage plant, reducing the cost of haulage.

The Otto Hoffman coke oven plant now comprises 312 ovens. The eighth battery of 56 ovens produced coke in April. Some additions were made to the coal and tar storage and ammonia house.

The No. 8 blast furnace made its first metal August 7, and is completed, with the exception of a spare gas blowing engine and appliances, now under construction.

Nos. 16 and 17 50-ton open hearth furnaces and the 200-ton hot metal receiver were completed toward the close of the year. Minor additions have been made to the bloom and billet mill, which with additioal boiler power now being erected should put this plant in fair balance for a larger output when required.

Excepting a curtailment of output in November and December, the car shop was in full operation during 1907, with satisfactory results. The additions under construction at date of last report have been completed. The plant is now idle, with little prospect of orders being secured in the early future.

Shipments of steel show a decrease of 4 43-100 per cent. in quantity, and 87-100 per cent. in the gross value of all products shipped, compared with the preceding year, which was the company's maximum year. The mills and shops were under great pressure to fill orders for their products up to the commencement of the financial panic in October, which promptly caused a substantial paralysis in all operations, and while the order books contained orders for several months' work ahead, in nearly all lines cancellations and suspensions practically rendered the plant idle, and from which it is slowly recovering.

Robert C. Morris has been appointed receiver for the Breakwater Construction & Engineering Company, New York, which is said to have $2,000,000 worth of contracts on hand for United States Government work.

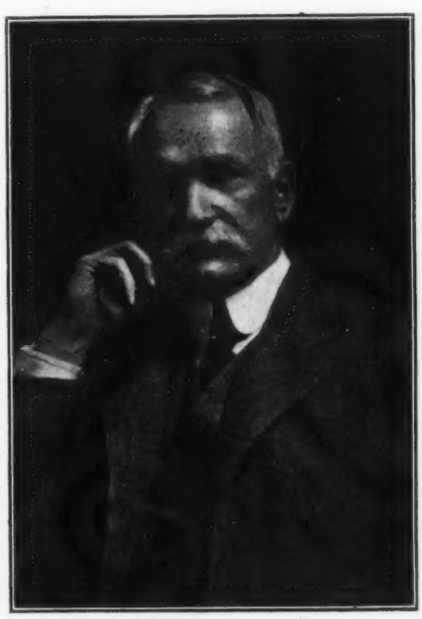
OBITUARY.

JAWOOD LUKENS.

Jawood Lukens, president of the Longmead Iron Company, Conshohocken, Pa., died March 10, aged 65 years. He belonged to a family of Pennsylvania ironmasters. He was named after J. A. Wood, his maternal grandfather, who was one of the earliest manufacturers of iron in the Schuylkill Valley. J. A. Wood's descendants are the owners of the Alan Wood Iron & Steel Company and of the John Wood & Brothers Iron Company, also of Conshohocken.

Jawood Lukens was the youngest son of Lewis A. Lukens, an original partner in the Alan Wood Company. The son took up a part of his father's interest in that company in 1873, but in 1881 he withdrew and started the Longmead Iron Company, with which afterward was incorporated the Conshohocken Tube Works, of which Mr. Lukens was one of the founders. These companies have grown to large dimensions and have enjoyed much prosperity.

Mr. Lukens served his community in the Town Council and on the School Board. He was long a director in



JAWOOD LUKENS.

the First National Bank and the Tradesman's Bank of Conshohocken and the Quaker City National Bank of Philadelphia. For many years he was treasurer and practically manager of the Conshohocken Water Works. In all these capacities and in his own business he was capable, assiduous, clearsighted and in possession of the confidence and esteem of his fellow citizens. In his private life his lofty character, his refinement, his consideration for others and his unblemished integrity warmed into affection the feeling of those persons with whom he came in contact. He was a remarkable member of a remarkable family. Mr. Lukens was born March 8, 1843, in Lebanon County, Pa., where his father had a charcoal forge. He was educated at a private school in Norristown, Pa., and at the Polytechnic College in Philadelphia. He graduated as a civil engineer in 1864, having meantime served in the Pennsylvania militia in the emergency calls of 1862 and 1863. After his graduation he was for a time engaged with an engineer corps in surveying a route for the Pan Handle Railroad in West Virginia and Ohio, and later was engaged in surveying in the oil fields of Pennsylvania. In 1867 he took a position in the employ of Alan Wood & Co., subsequently, as above noted, entering the firm. In 1868 he married Susan, daughter of Dr. Hiram Corson of Plymouth Meeting, Pa., who survives him. He was a member of the American Institute of Mining Engineers, the Engineers' Club of Philadelphia, the Franklin Institute, the Union League, the Art Club and the Manufacturers' Club.

DAVID A. CLARKE, who for a number of years has been purchasing agent for the Phœnix Iron Company, Philadelphia, Pa., died March 16, aged 64 years. He was born in Philadelphia, entered the employ of the Phœnix Iron Company in 1866, and continued with the company for 42 years, serving during a long portion of the time as purchasing agent. He was a man of sterling worth, honored by all who had business transactions with him, and was held in the highest esteem by the company which he had served for so many years.

Labor Notes.

It is reported from Montreal that the Nova Scotia Steel & Coal Company has decided upon a reduction of 10 per cent. in the wages of all employees. This is the first Canadian industrial concern to make a general reduction.

A convention will be held in June to put on a permanent basis the federation of labor unions in the metal trades, which was organized at Cincinnati in February. It is to be known as the Metal Trades Department of the American Federation of Labor. The temporary president is James O'Connell of the International Association of Machinists and the temporary secretary is James P. Frey of the International Molders' Union of North America. The national unions represented are those of the molders, machinists, patternmakers, blacksmiths, boilermakers, foundry employees, metal polishers and buffers, electrical workers, steam fitters, stove mounters, engineers and firemen. The local organizations of the new federation will be known as local metal trades councils.

The bimonthly wage adjustment between the Amalgamated Association and the bar iron mills that sign the Amalgamated scale were made in Pittsburgh last week. It was found that the average price on shipments of iron bars in January and February was 1.45 cents at mill, and this makes a reduction in puddling of 25 cents a ton, or from $6.37½ to $6.12½ for March and April. Wages of finishers will be reduced 2 per cent. for those two months. Wages of tin plate employees will be reduced 2 per cent. for March and April, the average price of shipments of tin plate in January and February having been $3.50 per box, which is 10 cents per box above the base of the scale. Wages of sheet mill employees will be reduced 2 per cent. for March and April over wages paid in January and February, which brings the wages of sheet mill hands down to the base of the sheet scale, which is 3 cents per pound, averaged for Nos. 26, 27 and 28 gauge.

The Decalcomania Industry.—Decalcomania manufacturers have won a victory in the United States Circuit Court at Philadelphia, which is expected to have the effect of reviving the industry in this country. The court holds that decalcomania paper is dutiable at 3 cents a pound and 20 per cent. ad valorem under the provision of the tariff for "surface coated papers." Since 1897 this paper has been entering the United States as "lithographic prints" with a duty of 20 cents a pound. The importers, however, have been separating the tissue carrying the decalcomania transfer from the body of the fabric, which greatly diminishes the weight, and it is said has reduced the effect of the duty to less than 3 per cent. ad valorem, practically driving domestic manufacturers out of business. Decalcomania transfers, while mainly used in the decoration of china and pottery, are also employed to quite a considerable extent in the decoration of house furnishing goods and other articles whose surfaces present favorable conditions for the adherence of the tissue. The importers will not accept the decision as final, but a new case is to be made up for another test.

The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, has been appointed sales agent in the Pittsburgh District for the Gould safety continuous feed water regulator, made by the Gould Mfg. Company, Chicago, for maintaining a uniform water level in steam boilers.

PERSONAL.

George R. Carr, vice-president of the Dearborn Drug & Chemical Works, Chicago, is on a combination business and pleasure trip to the City of Mexico. John W. Brashears, who for many years has been first assistant to W. A. Converse, chemical director of the company, in charge of its analytical laboratories, has been appointed assistant superintendent of the manufacturing department.

C. S. Johnson has severed his connection with the Mexican Steel Products & Machinery Company, S. A., Mexico, D. F., and the management is now composed of K. M. Van Zant, Jr., president and treasurer; Phillip G. Roeder, vice-president; Bernabé de la Barra, secretary, and W. H. Sinclair, manager.

William L. Saunders, president of the Ingersoll-Rand Company, New York, returned March 10, after a five months' absence in Europe.

Charles A. Schieren, Jr., of the Charles A. Schieren Company, New York, leather belting manufacturer, sailed March 17 for Europe, where he will visit the company's branch offices and agencies. He expects to be away four weeks.

R. S. Stangland has been placed in charge of Muralt & Co.'s construction office at New Fort Lyon, Colorado, and will superintend the erection of the complete lighting, heating and power plant which his firm is building for the United States Government at the New Fort Lyon Naval Hospital.

H. P. Bope, vice-president of the Carnegie Steel Company, and Homer J. Williams, general manager of the Duquesne Works of the same company, have returned from Mexico.

A. R. Hunt, general superintendent of the Homestead Works of the Carnegie Steel Company, has returned from Florida.

The Republic Iron & Steel Company, Pittsburgh, announces the following appointments: J. W. Deetrick, general superintendent of blast furnaces and steel works, with headquarters at Youngstown, Ohio, in charge of operation of all blast furnaces North and South and the Bessemer Steel plant and Brown-Bonnell Department at Youngstown. T. R. Akin, general superintendent of rolling mills, with headquarters at Pittsburgh, in charge of operations of the Mahoning Valley Works, Shafting Works, Corns Works, Toledo Works, Inland Works, Tudor Works, Sylvan Works and Indiana Works in the North, and Gates City and Birmingham Rolling Mill in the South. Frank L. Brown, chief clerk, will have charge of the order department, together with all clerical work of the operating department, in the Pittsburgh office in the Frick Building Annex.

W. E. Brandt, formerly mechanical engineer of the Pittsburgh Mfg. Company, has associated himself with Harry E. McCoy, 619 Ferguson Building, Pittsburgh. Under the name of McCoy & Brandt, the new firm will act as manufacturers' sales agent, and will also deal in second-hand machinery. It has secured the Pittsburgh agency for the products of the Whitlock Coil & Feed Water Heater Company, Hartford, Conn.

At the annual meeting of the stockholders of the E. W. Bliss Company, Brooklyn, N. Y., held March 17, William H. Lyon, treasurer of the Charles Parker Company, Meriden, Conn., and Jesse Metcalf of Providence, R. I., were elected directors to succeed Thomas B. Kent and W. E. Murdock, resigned. The other directors were re-elected.

R. Kent, formerly superintendent of the Bessemer Rolling Mill, Bessemer, Ala., has been appointed superintendent of the Tennessee Coal, Iron & Railroad Company's rail mill at Ensley, Ala., to succeed J. C. Sutherland, who becomes assistant superintendent of the company's Ensley steel plant.

At a meeting of directors of the Pittsburgh Coal Company held last week, W. K. Field was elected vice-president and placed in charge of the mining department. Mr. Field has been president of the New Pittsburgh Coal Company, a subsidiary interest, with former headquarters at Columbus, Ohio. Other officials of the Pittsburgh Coal Company for the ensuing year were elected as follows: M. H. Taylor, chairman and president; W. R. Woodford and C. E. Wales, vice-presidents; F. J. LeMoyne, secretary, and William Miller, treasurer.

The Railroad Engineering and Maintenance of Way Convention.

The ninth annual convention of the American Railway Engineering and Maintenance of Way Association was opened at the Auditorium Hotel, Chicago, on Tuesday, to continue in session for three days. The morning session of the opening day was devoted to an address by the president, A. W. Jackson, general manager of the New York, Chicago & St. Louis Railroad, and hearing reports of the secretary, treasurer and standing committees. Meetings were held in the morning, afternoon and evening, during which a number of interesting papers upon engineering problems relating to railroad construction and operation were presented.

The programme includes an extended list of subjects which will be considered in a large number of carefully prepared papers. The attendance, at the opening sessions, which was unusually full, included quite a number of prominent railroad officials and engineers, as well as a large number of manufacturers of railroad supplies. An extensive line of exhibits comprising railroad appliances and material occupied the parlor floor of the Auditorium, and was the center of attraction for a throng of visitors.

The Republic and the Amalgamated.—The continuous working agreement entered into in 1904 between the Amalgamated Association and the Republic Iron & Steel Company has been discontinued at the request of the Republic Company. Under the terms of the continuous agreement the mills were to remain in operation after the expiration of the wage agreement, June 30 each year, until a new agreement should be made. In the event of failure of the Amalgamated Association and the manufacturers to agree, the settlement was to be left to a Board of Conciliation. The award of the Board of Conciliation which met at Cambridge Springs in August, 1907, was not agreeable to the manufacturers, and has now led to the annulling of the continuous agreement. This action means that unless a settlement of the Amalgamated Association's scales is reached with the Republic Company prior to June 30 next, on which date these scales expire, the mills of the company will close down and remain closed until the question is settled.

The J. W. Paxson Company, Philadelphia, Pa., at a recent meeting elected the following officers, the action being made necessary by the recent death of J. K. Bougher, president. The new officers are: H. M. Bougher, president and general manager; L. B. Shaw, vice-president and marine superintendent; Howard Evans, treasurer; J. S. Hibbs, assistant general manager; S. C. Bougher, purchasing agent and secretary; A. G. Warren, consulting engineer.

The open hearth steel plant of the Sharon Steel Hoop Company, Sharon, Pa., which contains five 35 ton furnaces, and which has been idle since early in December, has been put in partial operation, four furnaces having started on Monday of this week. The company's hoop mills have also been started, to work up a small accumulation of orders. The duration of their activity depends on the inflow of orders.

The Warwick Iron & Steel Company, Pottstown, Pa., blew in its No. 1 furnace last week, and now has two stacks in blast. Orders have been sufficient to reduce to a considerable extent the stocks of pig iron on hand at the first of the year.

NEWS OF THE WORKS.

Iron and Steel.

Keystone Furnace of the Reading Iron Company, Reading, Pa., resumed operations March 13.

The Halcomb Steel Company, Syracuse, N. Y., has increased its capital stock from $1,500,000 to $1,750,000.

The Warwick Iron & Steel Company, Pottstown, Pa., blew in its No. 1 furnace March 12. As this furnace is equipped with the Gayley dry blast the company considers it best to keep it in operation rather than its No. 3 furnace, which is not equipped with the dry blast.

The tin plate plant of the Alcania Company at Avonmore, Pa., which contains three hot mills and has been idle for about two years, was put in operation March 16.

No. 4 Eliza furnace of the Jones & Laughlin Steel Company, at Pittsburgh, is to be torn down and rebuilt. This furnace made a practically continuous run of seven years, in which time it turned out 1,202,056 tons of Bessemer iron. The company is also making repairs to some of its other Eliza furnaces, and is relining and making important improvements to its Soho Furnace in Pittsburgh.

The three new blast furnaces of the Republic Iron & Steel Company at Haselton, Ohio, are now in operation and Hall Furnace, at Sharon, Pa., has also been started. This leaves two stacks idle, Atlantic at New Castle and Hannah at Youngstown.

D. Lamond & Son, Ferguson Building, Pittsburgh, have just completed the building of two Foote hot blast stoves, 18 x 85 ft., for the Hanging Rock Iron Company, Hanging Rock, Ohio.

It is reported on good authority that the plants of the Southern Steel Company will be put in operation within 60 days. These plants have been idle since the Southern Steel Company was adjudged a bankrupt in October, 1907.

General Machinery.

The Thomas Carlin's Sons Company, River avenue, North Side, Pittsburgh, Pa., manufacturer of shears, grinding pans, hoisting engines, &c., has received an order through the Garrett-Cromwell Engineering Company, Cleveland, Ohio, for two 9-ft. dry grinding pans and one 20 x 12 in. crusher, all to be equipped for motor drive, for installation in the new open hearth steel plant now being built by the Pittsburgh Steel Company at Monessen, Pa. The company has also booked some orders for medium and small sized shears from different concerns for use in cutting scrap.

The recent fire at the shops of the Northern Pacific Railroad at Jamestown, N. D., did but little damage to the buildings and only scorched the equipment. The machinery is being repaired and placed in operation.

The Crescent Machine Company, Leetonia, Ohio, manufacturer of woodworking machinery, states that notwithstanding the general business depression its business has held up remarkably well and at this time is showing some improvement. Never at any time during the financial stringency was it obliged to resort to the use of checks, but always managed to meet its payrolls with cash. The plant has been operated steadily right along and is even now obliged to run six days a week in order to keep up with deliveries. The company reports inquiries as rather plentiful, while the orders being received are scattering, coming from all sections of the country, which is construed as an indication that a reasonable quantity of business is being done, with good prospects for a further increase. The company is now working on several new machines which will be ready for formal announcement in a few weeks. These machines will be shown in its 1908 catalogue, which will be issued in about two months. It expects to make still further additions to its line of woodworking machinery, which will be announced later in the year.

Power Plant Equipment.

The Segura, Braniff Company, Orizaba, Ver.-Mexico, has been reorganized under the name of Compania de Luz Electrica y Fuerza Motriz de Orizaba, S. A. The new company has a capital stock of $1,200,000 and purposes to enlarge and extend the present system. Another large unit is being installed in the power house in order to accommodate the increased demand for light and power in the cities of Orizaba and Cordoba.

The Board of Water Commissioners of McGrawville, N. Y., will receive bids until March 30 for water works material, including one double geared power driven single acting triplex pump, with cylinders approximately 7 in. in diameter by 10 in. stroke, outside packed, with water delivery of from 200 to 320 gal. per minute. Specifications can be obtained from H. C. Chaffee, McGraw, N. Y., or from W. G. Stone, engineer, Utica, N. Y.

Sealed proposals will be received at the office of the County Clerk, Grand Rapids, Mich., until April 2, for additional water supply and fire protection system for the Kent County Home, including pumping station, tank, water main, &c.

Additional equipment being installed in the municipal electric light plant, Crustal Falls, Mich., includes two Leffel turbines; one 300-kw. Fort Wayne alternator, three-phase, 2300-volt, 60-cycle; one 1000-gal. per minute Gould triplex pump. Work upon this installation was begun last fall and will again be resumed some time in May.

The citizens of Wahoo, Neb., will on March 27 vote upon the question of a bond issue of $50,000 for the installation of a water plant, and $15,000 for an electric light plant.

The United Light & Power Company, Moline, Ill., incorporated with a capital stock of $60,000 to supply gas and electricity to the towns of East Moline, Silvis and Watertown, Ill., is planning to install a plant during the coming summer.

The Hill City Electric Power & Mining Company, Hill City, S. D., has been incorporated with a capital stock of $500,000, and has secured a water right on Spring Creek, near Hill City, where it is arranging to construct a dam and flume, the purpose being to generate current for lighting neighboring towns and supplying power to its own and outside mines. It is stated that as soon as the frost is out of the ground steps will be taken to carry out these plans.

The North Electric Company, Dallas, Texas, has been incorporated with a capital stock of $10,000, the officers being Geo. C. Steele, president; A. A. Marrs, secretary, treasurer and manager.

To provide funds for the rebuilding and partial re-equipment of its electric light plant, burned last January, the city of Linneus, Mo., has voted bonds in the sum of $3500. Motive power will be supplied by an Atlas four-valve heavy duty engine of 125 hp., and a boiler also furnished by the Atlas Engine Company, Indianapolis, Ind. Plans for the remaining machinery requirements are being prepared.

The F. G. Grote Mfg. Company, Evansville, Ind., has been incorporated with $50,000 capital stock. It will manufacture heating appliances and machinery to furnish power. The directors are F. Grote, Emil Grote and J. D. Carmody.

Foundries.

The Columbiana Foundry Company, Columbiana, Ohio, manufacturer of gray iron castings up to 5 tons, is completing a contract for the Brier Hill Iron & Coal Company, Youngstown, Ohio, for the castings required in the new blast furnace being built by that company.

The Coatesville Foundry & Machine Company, Coatesville, Pa., which purchased a tract of land just outside of the city limits in the latter part of 1907, has placed a contract with the McClintic-Marshall Construction Company, Pottstown, Pa., for the construction of buildings on the site, which will be equipped for the manufacture of boiler fronts and other castings, such as grate bars, &c. The buildings will be of structural steel and will include a main structure, 114 x 208 ft.; fireprof pattern shop, 40 x 60 ft.; pattern storage buildings, &c. The machinery, pattern shop and foundry equipments have been purchased, and the company expects to have the plant ready for operation in the early part of August.

The Anderson Foundry & Machine Works, Anderson, Ind., has increased its capital stock from $50,000 to $100,000.

The McInnes Steel Company, Corry, Pa., has started up its new plant for the manufacture of steel castings. The company has a good many orders on its books and is operating its entire plant to nearly full capacity.

Bridges and Buildings.

Bids are being received by the Northwestern Consolidated Milling Company, Minneapolis, Minn., for the construction of a 1,000,000-bushel fireproof elevator, which is to be erected on property adjacent to the A. & F. mills of the company.

Fires.

The machine shop of the Bryant Machine Company, at Rumford, R. I., was damaged $5000 by fire, March 10.

The coke washer, tipple, engine house and laboratory of the Colorado Fuel & Iron Company at Sophis, Colo., were damaged $50,000 by fire, March 15.

On March 13 part of the paper mill at Herrings, owned by W. P. Herring, Watertown, N. Y., was burned.

Hardware.

The Howard Stove & Mfg. Company, Savannah, Mo., is contemplating a change of location, and has under consideration propositions from St. Joseph, Mo., and Pueblo, Colo., offering inducements for the establishment of the plant in those cities.

The Southern Stove Works, Evansville, Ind., is notifying its customers that reports of damage done to its plant by fire on March 5 are greatly exaggerated. Only one storage house for patterns and the mounting room on the third floor were destroyed; the loss incurred by the destruction of these two buildings and contents will not exceed $20,000. Orders are being promptly filled from stock on hand and arrangements are being made to rebuild the destroyed portion of the plant as soon as the loss is adjusted.

The Harness Specialty Company, recently incorporated under the laws of Ohio with a capital of $20,000, has secured one of the buildings formerly occupied by the Crescent Machine Company, Leetonia, Ohio, and which is three stories high and 50 x

125 ft. in size. The building has been equipped with modern machinery for the manufacture of leather specialties for harness.

The Ohio Lock-Nut & Bolt Company, Columbus, Ohio, manufacturer of the Amberson lock-nut, has a plant at Summit Station, Ohio, equipped to turn out 10 tons of nuts per day, varying in size from ⅜ to 1½ in. Machinery is also being installed for the production of bolts and washers, and the company will be able to make deliveries about April 15.

The Penn Shovel Mfg. Company, Warren, Ohio, has gone into the hands of receivers, Clay Hanna and Gordon Brown having been appointed by the court. It is probable the company will be reorganized.

The Iddings Company, Warren, Ohio, has been incoporated to take over the business of the Peerless Sifter Company, a partnership composed of Frank A. and W. T. Iddings. The new company has a capitalization of $75,000. The business of the company will be extended and it is expected that other lines will be taken up.

Miscellaneous.

The financial statement issued by A. B. Brock, receiver of the Beaumont Iron Works, Beaumont, Texas, February 29, shows a surplus over liabilities of $75,613.44.

The Sterling Alternating Ignition Company, organized a short time ago, is now operating its factory at Binghamton, N. Y., where it is manufacturing electrical ignition apparatus and automobile timers.

The Hines Mfg. Company, Portland, Ind., has incorporated, with a capital stock of $100,000, to manufacture sectional collapsible steel derricks, the invention of John L. Hines, who is president. A new plant will be equipped for constructing the derricks.

The property and equipment of the Southern Metal & Mfg. Company, Cape Girardeau, Mo., will be sold at foreclosure sale March 30.

The Storm King Stone Company has placed a contract with the Mashek Engineering Company, New York, for a 1000 cu. yd. per day stone crushing plant, to be built at Storm King Mountain, on the Hudson River. The contract calls for the complete plant to be turned over to the owners in operation. All plans are complete and work on foundation and dock will be started this week.

The Davenport Wagon Company, Davenport, Iowa, has completed plans for a new wagon factory, the erection of which will be begun at once. The buildings are to be of reinforced concrete and modernly equipped with suitable machinery for the manufacture of the Davenport roller bearing steel wagon, which will now be made on an extensive scale.

The C. W. Smith Elevator Company, Chicago and Perry streets, Buffalo, N. Y., has incorporated, with a capital stock of $25,000, to manufacture freight and passenger elevators under the patents and designs of Charles W. Smith. The directors are Charles W. and Merritt E. Smith of Buffalo, and Frank L. Barnet of Alden, N. Y. Arrangements have been made for manufacture, so that no new equipment or machinery will be required at the present time. Offices have also been established at Cleveland, Pittsburgh, New York and Boston.

The Best Mfg. Company, Pittsburgh, manufacturer of complete piping equipments for power plants and blast furnaces, has received an order from the United States Coal & Coke Company, Gary, W. Va., for all the steam, exhaust, boiler feed and blow-off piping, including valves and fittings, ranging in size from 16 in. down, for the new power plant being erected by the latter company. The work is now under way and will be completed in about two months.

The James McNeil & Brother Company, Pittsburgh, has lately been awarded a contract by the Pittsburgh Steel Company, involving 800 to 900 tons of material. The work consists of several large flues for 51 gas producers, the flues varying in diameter from 5 to 8 ft., including all branches, supports and castings; also eight self-supporting steel stacks, 12 ft. bottom diameter and 175 ft. high, for open hearth plant, and five self-supporting steel stacks, 7 ft. bottom diameter and 100 ft. high, for soaking pit furnaces. All this work is to be erected at the new plant of the Pittsburgh Steel Company at Monessen, Pa. This same company has been awarded a contract by the Liquid Carbonic Company, Pittsburgh, for several large cooling towers and tanks, the largest of which are 10 ft. in diameter and 100 ft. high.

The Ash Grove Lime & Portland Cement Company, Kansas City, Mo., has now under construction at Chanute, Kan., a high grade Portland cement plant, which is designed to be one of the most modern and best equipped plants in the Middle West. Five 8 x 125 ft. rotary kilns will be installed and the fuel used will be natural gas, of which the company now has a flow of 130,000,000 ft. per day. The entire mill will be operated by a power plant consisting of four 22 x 42 in. Reynolds Corliss engines, built by the Allis-Chalmers Company, Milwaukee, and supplied through the Hunt Engineering Company, Chicago. These engines will be connected by rope drive to line shafts operating the cement-making machinery.

New Publications.

The Present and Future of the Bituminous Coal Trade. By Henry S. Fleming. 8 vo., 90 pages, with numerous inserted tables and diagrams. Published by the Bituminous Coal Trade Association, New York.

Mr. Fleming is the secretary of the Bituminous Coal Trade Association, 1 Broadway, New York, and this volume is his report to the association on the world's supply and consumption of bituminous coal. Following somewhat the method of some statisticians who have estimated the curves of iron production and consumption in the United States, Mr. Fleming has made estimates of the future movement of bituminous coal. His calculations are based on the determination of the theoretical curve produced by the known tonnage of past years. The intention has not been to predict the actual tonnage for any year or period of years, but to show the tendency in so far as it may be anticipated by the yearly records of the trade. The rate of increase will doubtless change, but the writer says that the rate of the decrease in the increase is so slight that the reversing of the curve is remote. While the total production will continue to become larger from year to year, the rate of percentage increase will become less each year, it is predicted, until far in the future the total production year after year will be about the same. Then, with the gradual exhaustion of the coal fields, it will in the same manner begin to decrease.

Mr. Fleming has made his report a statistical encyclopedia of the bituminous coal trade of the world. Naturally the production and consumption in the United States are given with fullest detail. An interesting set of statistics is that in which the table of yearly production and consumption of bituminous coal in the United States at 5-year intervals is supplemented with estimates for future decennial and quinquennial years, beginning with 1910. For that year the estimated production of bituminous coal in this country is 365,000,000 tons; for 1915 it is 480,000,000 tons; for 1920, 606,000,000 tons, and so on up to 1950, for which the estimated production is 1,355,000,000 tons. Another interesting table is that which gives the distribution of bituminous coal consumption in the United States according to uses. For example, in 1905 44,000,000 tons went into coke, 97,000,000 tons was consumed by railroads, 117,000,000 tons was burned in industrial and domestic fires and 7,000,000 tons was exported. For 1910 the estimate is 46,000,000 tons for coke, 124,000,000 tons for railroads, 163,000,000 tons for industrial and domestic use, and 12,000,000 tons for export. For 1950 the estimated totals are, respectively, 216,000,000 tons, 418,000,000 tons, 489,000,000 tons and 157,000,000 tons.

Mr. Fleming says that while his estimates of production for 1906 and 1907, based on records for preceding years, were largely exceeded by actual production in those two years, he considers that his hypothetical line will not be far from the average output in coming years. A remarkable fact is brought out in one of the diagrams, namely, that there have been but five years in the history of the trade in which the production of bituminous coal has been less than in the preceding year. This outdoes the record of pig iron production, remarkable as that is considered to be, for making new high points and for rapid recovery after a year of declining production. Another revelation of the tables, to which attention is called, is that from 1825 to the present time the production of bituminous coal in the United States for any 10 years has been greater than the total from 1825 to the beginning of that 10 years.

In addition to many pages of statistics of coal production by States from 1814 to the present time, there are 35 inserted sheets, equivalent to two pages each, containing detailed statistical tables. The diagrams plotting the production in the United States and foreign countries year by year are contained in a pocket at the back of the book.

The Iron and Metal Trades

The volume of new orders booked by the rolling mills and Steel works continues to hover about the 50 per cent. mark of actual productive capacity. There is, if anything, a falling off in railroad purchases, which is compensated for by the better demand for the lighter lines. Among these the Wire trade is conspicuous. It is estimated that the leading interest is taking orders thus far in March equal to 82 per cent. of the business taken during the same period last year. Tin Plate is doing well and an increasing number of mills is being put into operation.

The Steel Rail trade is very quiet and car builders have very little work. There is the prospect of more activity in locomotive building. One leading system is in the market for 100 locomotives, another is asking for bids on 25 locomotives, and an order has been placed for 30 engines for export to France.

It is significant that the St. Paul road has decided to build for its Pacific Coast extension 2500 60-ton Steel under-frame freight cars and 70 locomotives, in its Milwaukee shops. An order for the Steel under-frames has been placed and the inquiry for the 10,000 axles is in the market.

Fabricators, particularly the smaller ones, are taking structural work at very low prices, so that the question is asked whether they do not in some way obtain the Shapes at concessions. It is pointed out, however, that costs have been markedly lessened through the greater efficiency of labor, which is a striking factor in nearly all manufacturing operations. Quite a number of small contracts have been closed, and a fair amount is in sight. One of the interesting transactions of the week has been the sale of 7000 tons of Sheet Piling for harbor work at Buffalo.

The Pig Iron markets have continued dull and are characterized by an increased amount of cutting of prices. Nearly every district has its independent interests, who are securing the bulk of what little business is being done, by making concessions. At Birmingham $12 can be done for No. 2, and at Virginia points $14 is available. Unless business picks up the situation will have to be met by the majority of the merchant furnaces, who until now have believed it a wise policy to maintain prices.

Quite a number of small contracts for Cast Iron Pipe have been placed lately, and additional tonnage is coming up, but very low figures are being made in many instances.

Copper is firmer, and 13c. is now being generally asked. The reports of large sales lack confirmation, and leading consuming interests do not report any appreciable betterment in the requirements. Thus far Europe has purchased very large quantities which certainly have not gone into consumption, and the question arises whether the desire and the ability to buy surplus Copper for the future may not be ultimately impaired.

Pig Lead has been put up ¼c. per pound during the week, making the New York price 4c. a pound. It is stated that the demand from corroders is good.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.18, 1908.	Mar.11, 1908.	Feb.19, 1908.	Mar.20, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$25.25
Foundry No. 2, Southern, Cincinnati	*15.25*	15.75	15.75	26.00
Foundry No. 2, Local, Chicago	*17.50*	17.50	17.75	26.00
Bessemer, Pittsburgh	17.90	17.90	17.90	22.85
Gray Forge, Pittsburgh	15.90	15.90	15.90	21.75
Lake Superior Charcoal, Chicago	21.50	21.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	30.40	30.40	30.40	33.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.25*	12.25	13.00	18.00
Steel Rails, Melting, Phila	*12.75*	13.00	15.00	19.25
Iron Rails, Chicago	*15.00*	15.75	17.00	25.00
Iron Rails, Philadelphia	*17.00*	18.00	18.00	27.00
Car Wheels, Chicago	**15.50**	15.50	15.00	24.00
Car Wheels, Philadelphia	*14.00*	16.00	16.50	24.00
Heavy Steel Scrap, Pittsburgh	*13.00*	13.00	13.75	18.00
Heavy Steel Scrap, Chicago	*11.50*	11.50	12.50	16.00
Heavy Steel Scrap, Philadelphia	*12.75*	13.00	15.00	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.90*	1.90	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.00**	12.62½	12.87½	25.50
Electrolytic Copper, New York	**12.87½**	12.50	12.62½	25.37½
Spelter, New York	**4.80**	4.75	4.75	6.95
Spelter, St. Louis	*4.60*	4.60	4.80	6.80
Lead, New York	**4.00**	3.75	3.75	6.30
Lead, St. Louis	**3.85**	3.60	3.65	6.10
Tin, New York	**30.50**	29.25	28.15	40.65
Antimony, Hallett, New York	9.00	9.00	9.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, March 18, 1908.—(*By Telegraph.*)

The most important industrial development of the week is the announcement made by the Chicago, Milwaukee & St. Paul Railroad of its purpose to build at its Milwaukee shops 2500 60-ton Steel underframe freight cars for its new Pacific Coast line, now under construction. Work on this equipment is to begin at once. An order for the Steel underframes and trucks has been placed, and an inquiry for the 10,000 Axles required is now in the market. Arrangements are being made for the building of 70 locomotives for the new line, which will also be constructed in the company's shops. Further evidence of a more active demand for the material by the railroad is furnished by a perceptible betterment in the movement of Track Supplies. Purchases recently noted were last week supplemented by additional orders aggregating 25,000 kegs, taken by the principal interest. The formal closure of a contract awarding to the Cambria Steel Company the remaining 10,000 tons of the Great Northern's 60,000-ton Rail order was effected the past week. An increasing number of small orders for Standard Section Rails is also noted, and Light Rail orders are being offered a little more freely. Of the 10,000 tons of Structural Material on which closure is reported, the most important contract was that of 7000 tons of Sheet Steel Piling for harbor work at Buffalo. Plans including an aggregate of 10,000 tons for various building structures are now in the hands of fabricators for estimates. Plates, Bars and Tubular Goods continue inactive, though on the whole there is, perhaps, a slight improvement. It is reported that an advance of 25c.

a ton in freight rates on Cast Iron Pipe has been agreed upon by the Central Freight Association, to apply in central territory north of the Ohio River. The rate from the river to Chicago was advanced last fall from $1.60 to $2, and the proposed rate would fix the tariff at $2.25. The additional advance has not yet been promulgated and is meeting with strenuous opposition from Cast Iron Pipe interests. The purchase of 2000 tons by a local stove foundry was the chief feature of the week in the Pig Iron market. The strain of protracted dullness is bearing heavily upon values and is resulting in further weakness. The demand for Metals has sensibly improved, and under the strengthening influence of more active buying prices have firmed up, with a slight advance in Copper.

Pig Iron.—The sale of 2000 tons of No. 2 Southern Foundry constituted the chief transaction last week in this market. It was made to the Moore Bros. Company, Joliet, manufacturer of stoves, for delivery through the second, third and fourth quarters. The order, it is understood, was taken by a Tennessee furnace, but nothing definite regarding the price made has been learned. Offers made on this business by the various furnace interests indicate a marked disinclination on the part of the principal producers to contract for deliveries extending through the last half on the basis of present minimum prices. It is no longer questioned that some of the Southern furnaces are willing to do $12, Birmingham, on shipments through the first half, and even somewhat beyond that time, but the majority of them are at present not disposed to make large commitments for low priced contracts throughout the year. One sale of not over 300 tons for last half delivery was made last week at $13.50, Birmingham, by a seller whose price for second quarter on the same quantity was $13. While it is doubtless true that a majority of the small lots now changing hands in this market command $13, Birmingham, it is nevertheless evident that the offering of considerable tonnage does not fail to bring out lower prices on Southern Iron. In view of this fact, that market is more fairly represented by quotations of $12.50 to $13, Birmingham, for No. 2 Foundry, in accordance with which they are this week revised. Aside from the principal sale above noted, business for the past week has been limited to a few scattering orders, ranging from car lots to 400 tons. There has been a slight improvement in the number of inquiries received, which are practically all for Foundry Iron. Some talk of an advance in freight rates is heard, but furnacemen regard such action at the present time as being so wholly out of line with current conditions that the railroads will hardly insist upon an advance over existing tariffs. The following prices are for March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	17.35 to 17.85
Southern Coke, No. 2	16.85 to 17.35
Southern Coke, No. 3	16.35 to 16.85
Southern Coke, No. 4	15.85 to 16.35
Southern Coke, No. 1 Soft	17.35 to 17.85
Southern Coke, No. 2 Soft	16.85 to 17.35
Southern Gray Forge	14.85 to 15.35
Southern Mottled	14.60 to 15.10
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(By Mail.)

Billets and Rods.—In actual orders placed nothing of noteworthy importance has developed. There is, however, an inquiry in the market for 2500 tons of Car Axles, which represents definite requirements, and to cover which it is expected that an order will be placed without delay. Under present conditions a purchase of this size will doubtless serve to test the firmness of the market. On current transactions, which are few and unimportant, prices on Forging Billets are reported to be firmly held at the ruling quotations of $33 to $34, Chicago. Wire Rods continue unchanged as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—Some betterment is noticed in the number of small orders coming out for Rails, which are evidently being required for maintenance work. Individually these orders rarely exceed a few hundred tons, but in the aggregate they help materially to fill out rolling schedules. The demand for Track Supplies continues on a fairly liberal scale, the principal interest having during the past week booked an aggregate of 25,000 kegs. Of this amount 22,000 kegs were comprised of 12,000 kegs from the Northern Pacific; 5000 kegs from the Great Northern, and 5000 kegs from the Chicago, Burlington & Quincy, the remainder being made up of miscellaneous orders. Light Rails show some improvement, orders of lots from 100 to 500 tons being more frequent, but prices are still being cut from $3 to $4 a ton. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Fabricators are finding encouragement in the hopeful signs of movement that are beginning to appear among some of the deferred building projects. The Milwaukee Auditorium, which has been held up by litigation for several months, has finally been let to the Worden Allen Company, Milwaukee; about 1700 tons are required for this structure. Another contract that has been hanging fire for some time is that of the Raymond Lead Company, Chicago, 387 tons, which was let to the South Halsted Street Iron Works. The American Bridge Company secured a contract for 526 tons of fabricated material for the Barron Estate Building, San Francisco, which was supplemented by other orders taken during the week amounting to approximately 900 tons. The most important transaction of the week was a Government contract taken by McArthur Brothers, Chicago, for 7000 tons of Sheet Steel piling, to be used in harbor work at Buffalo. Figures are now being submitted on a large Catholic cathedral to be constructed in St. Louis, plans for which call for 1000 tons of Steel; and figures are also being submitted on 1000 tons for the Anaconda smelter, Butte, Mont. Prospects are favorable for the nearby closure of contracts on the 18-story Leavy Estate Building, Seattle, Wash., for which between 2000 and 3000 tons of Structural Shapes will be required. There are a dozen or more post-offices and public buildings being figured on throughout the Middle West, which involve an aggregate of about 6000 tons. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Both as respects new orders and specifications, business in Plates is exceedingly quiet. While there is here and there some work in prospect that if carried out would produce a fair Plate tonnage, nothing of importance is being closed. Jobbers' stocks are not being depleted fast enough to require much replenishment. Prices continue to be shaded by some mills from $1 to $3 a ton. We quote for shipments from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for Sheets continues to improve slowly, and the rolling schedules of Sheet mills are better filled than those of other lines. Buyers generally are not anticipating their wants far ahead, but are supplying specifications pretty freely for current needs. A fair amount of business is being done by jobbers in both Black and Galvanized Sheets, and prices continue firm. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Bar Iron specifications have been coming out a little better, and as a result the East Chicago mills of the Interstate Iron & Steel Company ran steadily all of last week. Some new business is also being received, but it is small in proportion as compared with the whole. Steel Bars are exceedingly quiet, and specifications from consumers are scanty and irregular. Quick shipments are demanded on nearly all orders, which are plainly for immediate use. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Moderate improvement is noted in the general volume of business being booked, which continues to

be made up of small orders for actual requirements. There is, however, a notably better feeling in the market, which is reflected by more numerous inquiries, indicating a resumption of outside operations. Under the pressure of strong competition store prices continue relatively low and irregular and afford but little profit to jobbers on stock shipments. Mill prices hold firm on Steel Pipe. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. From 2 to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—There is possibly a little more activity in Merchant Tubes, but not of a pronounced character, such as would indicate positive improvement. Store stocks move slowly in small lots on orders arising from current requirements. Railroads are taking Locomotive Tubes a little more freely, but it is evident that their orders include nothing more than is actually required for repair work. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—As respects the demand from implement makers conditions are unchanged, and, indeed, there is little prospect for decisive betterment from this source during the remainder of the season. Orders and specifications in moderate amount for plain and special Tires are coming from the wagon makers and jobbers, but the demand for Smooth Finished Steel and Crucible Tool Steel is limited. Shafting is inactive and irregular; discounts continue to be shaded from 5 to 10 per cent. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Old Material.—With practically no support from consumers the market shows some tendency toward further weakness, which has, however, not yet developed into actual recession, except on a few grades. Railroad Wrought is off about 50c. a ton, and Iron Rails have declined 25c. The mills are taking on no more tonnage, except upon attractive offers. Last week's railroad offerings dragged somewhat, very little going to consumers. Lists to be closed this week include 1650 tons from the Missouri Pacific and 5000 tons from the Baltimore & Ohio, 2200 tons of the latter being Rerollers. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.25 to 12.75
Old Steel Rails, less than 3 ft.	12.25 to 12.75
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.25 to 16.75
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.25 to 15.25
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.50 to 9.00

Cast Iron Pipe.—The principal prospective business reported is a lot of 2000 tons to be let March 17 by the city of Cincinnati. Among the awards made last week were 900 tons by Columbus, Ohio, and small lots by Fort Wayne, Ind., and Milwaukee, Wis., all of which were taken by the United States Cast Iron Pipe & Foundry Company. Routine orders, including requirements of municipal water plants, are fairly numerous. Most of the foundries have considerable stock on hand, and the competition for such business is unusually keen. We continue to quote per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Metals.—Last week brought out more orders for Copper than have developed in the past month or more. Several carload lots were included in these transactions, and the demand from smaller consumers was considerably improved Copper prices are a shade stronger, and Pig Tin has advanced 1c. a pound. A little better movement is also noted in Old Metals, the prices of which remain unchanged. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 3.95c. to 4c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Pittsburgh.

PARK BUILDING, March 18, 1908.—(*By Telegraph.*)

Pig Iron.—The market continues excessively dull, and only small lots of Pig Iron for prompt shipment are being sold. There is probably a little more inquiry so far this month than in February, but consumers seem to lack confidence in the future, and are buying only such Iron as they absolutely need. The official prices on Foundry Iron agreed upon at the meeting held in Cleveland a few weeks ago are not being strictly held. We continue to quote Standard Bessemer Iron at $17, at Valley furnace, but reports are that a few small lots have sold as low as $16.75, at furnace. Basic Iron is weak, and a sale of 500 tons is reported on the basis of about $15.50, Valley furnace. Northern No. 2 Foundry Iron is about $15.75 to $16, Valley furnace, but several recent sales were on the basis of $15.50, at furnace. We note a sale of 300 tons of Northern Forge Iron at $15, Valley furnace, or $15.90, Pittsburgh, and we quote the market at that price.

Steel.—Considerable tonnage in Sheet and Tin Bars is being taken by consumers, but the demand for Billets is very dull. Reports are that small quantities of some sizes of Billets are still being furnished by outside mills at less than regular prices. We quote Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29.50, and Forging Billets at $30, for delivery in Pittsburgh and nearby districts.

(*By Mail.*)

Weekly reports received from agents all over the country by several of the leading local Steel companies are almost a unit in stating that general conditions are beginning to show betterment, and the tone of the market is more cheerful than for some time. However, improvement will probably be very slow. It is the impression that, while the second quarter may show up better than the first, material improvement is not likely to come until the political situation has cleared up and the money market has become easier. Railroads and traction lines still find it difficult to get money except at very high rates of interest, and numerous projects have come up involving large tonnages of material, which are almost invariably turned down by the mills, as terms of payment are not satisfactory. In the Mahoning and Shenango valleys only four merchant blast furnaces are running, these being No. 3 of the Shenango Furnace Company and the stack of the Youngstown Steel Company, which are on Bessemer, and one, Andrews & Hitchcock, and the Girard, both of which are on Foundry. None of the Valley furnaces is running on Basic or Forge, a very unusual condition, and one which shows clearly the lack of demand for Pig Iron. The output of Bessemer Iron in the two valleys last week was only 1685 tons, while the shipments of Bessemer and Basic were over 6000 tons. Stocks are still pretty heavy, but if this ratio is maintained they will soon show a material decrease. Both Bessemer Steel plants at Youngstown are idle this week, but the Sharon Steel Hoop Company, Sharon, Pa., has started to clean up accumulated orders. The demand for Steel is light, and occasional lots of Billets are being sold at about $2 a ton less than regular prices by sev-

eral outside mills in conversion deals. The business in Finished Iron and Steel placed with the mills so far this month is a little larger, on the whole, than in the same period in February. Coke and Scrap are both very dull and prices are weak.

Ferromanganese.—A local Tin Plate interest is reported to have bought a small lot of Ferro at a price somewhat under $46, Pittsburgh. A good deal of Ferro is being offered for resale by consumers who cannot use it and who need money, with the result that such lots are sometimes sold at $1 to $2 a ton under the regular market price. We quote 80 per cent. at about $44, Baltimore, or $45.95, Pittsburgh, but on a firm offer and for any considerable tonnage this price would be shaded about $1 a ton.

Muck Bar.—In the absence of actual sales on which to base prices, we continue to quote best grades of Muck Bar made from all Pig Iron at nominally $27 to $27.50, Pittsburgh.

Skelp.—There has been some little inquiry, but general conditions are very quiet. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—The new demand for Rods continues dull, but the market is firm. The Youngstown Sheet & Tube Company on March 16 took possession of the plant of the Morgan Spring Company at Struthers, and is now prepared to quote on Rods through its home office at Youngstown and its regular agents. We continue to quote $35 for Bessemer Rods, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has taken contracts for about 1500 tons of Light Rails for export, among which were 1100 tons of 18-lb. sections. The inquiry for the Isthmian Canal Commission for 2200 tons of Standard Sections, together with fastenings, has not all been placed, but the purchase is likely to be made of a Pittsburgh mill. Practically no domestic business in Standard Sections has been done, and the Rail mills have little work ahead. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New buying is very light, and specifications against contracts are coming in slowly. Requirements of Plates from the Steel car interests have dwindled to almost nothing, and the outlook for orders from this class of consumers is not very bright. Prices on narrow sizes continue to be shaded from $1 to $2 a ton, but not enough new business is being offered to thoroughly test the market. Regular prices are as follows: We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Reports that the Oliver Building project for an office structure, occupying the square on Smithfield street from Oliver to Sixth avenue, and which will require about 14,000 tons, had come to life again, are not confirmed. It has gone over until next year. All the Structural concerns are badly in need of work, and very low prices are being made on the small amount that is coming out. We quote: Beams and Channels, up to 15 in., 1.70c.: over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.: 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The demand for Corrugated Sheets is showing betterment, while Black and Galvanized Sheets are also reported to be showing some improvement. This week the American Sheet & Tin Plate Company is operating 44 per cent. of its Sheet mills, against 40 per cent. last week. Prices on the whole are fairly well maintained, but slight concessions are sometimes made by a few mills that are anxious for orders. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is increasing, and the outlook is brighter than for some time. The American Sheet & Tin Plate Company has just started 10 of the hot mills at its Sharon Works and expects to start the other 10 mills next Monday. We are advised that regular prices are being maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The differential of $2 a ton on Iron Bars against Steel is having the effect of diverting some business to the former by consumers who usually specify Steel Bars. For this reason new orders for Iron Bars and specifications against contracts are coming in a little more freely. It is a notable fact that on orders for both Iron and Steel Bars consumers usually specify prompt deliveries, showing that stocks in the hands of jobbers and consumers are much lighter than usual. The price of 1.60c. on Steel Bars is being strictly maintained, but the mills are entering very little new business. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Hoops and Bands.—A fair amount of specifying against contracts is being done, but some that should be coming forward has been held up, and practically no new business is being entered by the mills. The Sharon Steel Hoop Company has started its mills to work off an accumulation of orders. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—The market is weaker, the restriction in output agreed to by the smelters not having yet had the effect of firming up prices. Prime grades of Western Spelter are offered as low as 4.50c., East St. Louis, equal to 4.62½c., Pittsburgh, and very little new business is being placed, many consumers of Spelter operating their plants to half capacity or less.

Railroad Spikes.—This trade continues unusually quiet, and very little new business is being placed with the mills by the railroads or other consumers. Some of the Spike mills are badly in need of work, and concessions in prices are being made. We quote Standard sizes of Steel Railroad Spikes at $1.80, but this price is shaded in competition with Iron Spikes. Prices on the smaller sizes range from $1.85 to $1.90 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—While business continues light, some mills report that so far this month it is a little better than in February. Specifications against contracts are not coming in at a satisfactory rate, and shipments by the mills are light. Cold Rolled Shafting continues to be shaded, 55 and 2½ per cent. being named on carloads. Tire Steel is in fairly good demand, but the other grades are dull. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b., at mill.

Iron and Steel Scrap.—The market has been quiet and very little material has been sold. The Sharon Steel Hoop Company has an embargo on Scrap, which may soon be removed, as this company has started up its Steel plant to partial capacity. Bids on the Baltimore & Ohio Scrap have gone in and awards are to be made on the 19th. Prices are weaker, and it is more of a consumers' market than for some time. Dealers quote about as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50.

Pipes and Tubes.—Several of the larger mills report

that orders entered so far this month show an increase in volume of about 25 per cent. over the corresponding period last month. The Oklahoma Natural Gas Company, which laid several gas lines last year, is preparing to lay more lines this summer, and is figuring on 15 miles of 8-in. Pipe which is likely to be closed this week. Jobbers are buying a little more freely, but are still disposed to limit their purchases to actual requirements and not carry large stocks. The market on both Iron and Steel Pipe is firm, but there is still an impression that possibly prices may be changed before long. However, nothing official about this has been given out, and the mills continue to adhere rigidly to regular prices. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in	63	
⅜ in	65	51
½ in	67	55
¾ to 6 in	71	61
7 to 12 in	68	53
Extra strong, plain ends:		
⅛ to ⅜ in	56	44
½ to 4 in	63	51
4½ to 8 in	59	47
Double extra strong, plain ends:		
½ to 8 in	52	41

Boiler Tubes.—The demand continues quiet, and prices are only fairly strong, one or two mills being disposed to make concessions to get orders. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—The Coke trade continues exceptionally quiet, and there is very little demand for either Furnace or Foundry Coke. It is stated that about 40 per cent. of the ovens in the Connellsville region are active, while in the Latrobe and other districts a smaller percentage of ovens is being operated. Furnace Coke made in the Latrobe and Klondike districts is being offered at $1.60 to $1.65, at oven. Best grades of 72-hr. Foundry Coke are usually quoted at $2.25, but Foundry Coke made outside of the Connellsville region is offered as low as $2.10, at oven. The output of Coke last week in the Upper and Lower Connellsville regions was 158,824 tons, a slight increase over the previous week.

On April 1 the offices of Walter-Wallingford & Co., Pig Iron and Coke, now located in Farmers' Bank Building, will be removed to the People's Bank Building, Fourth avenue and Wood street, Pittsburgh.

Charles H. Daker, formerly connected with the Pittsburgh office of Hickman, Williams & Co., has resigned, and is now secretary of the Iron City Steel Company, 615 Bessemer Building, Pittsburgh. This company deals in new and Relaying Rails, and is arranging to handle Sheets, Bars, Angles and other forms of Iron and Steel.

On April 1 the offices of the Wilkoff Brothers Company, dealer in Iron and Steel Scrap, will be removed from Park Building to Room 826, Farmers' Bank Building, Pittsburgh.

Cincinnati.

CINCINNATI, OHIO, March 18, 1908.—(*By Telegraph*).

Only in the slightest degree and in very few directions can there be regarded any improvement in the trend of trade in Iron and Steel. Sentimentally the market is improved, the increase in Coke shipments suggesting enlarged melt of Iron, although the furnacemen's coffers cannot be regarded as fuller thereby, for melters are still taking hold-up contracts. The jobbing foundries show little or no interest in the Pig Iron market, and there is a falling off of inquiry from the pipe men and stove makers. Freights on both Coke and Pig Iron have been factors in the daily routine of Coke and Iron manufacturers' lives the past few days, and some important meetings which have officially considered and requested freight reductions have been fruitless. A quarterly meeting of the Central Association of Stove Manufacturers has been concluded to-day at the Hotel Havlin, at which it was determined to reaffirm the prices named in the resolutions of last December, recalling that the advances warranted by the manufacturing cost at that time were not made, and further also because of the existing molding contracts between the Stove Founders' National Defense Association and the International Molders' Union. The last advance in prices was in February, 1907. It was determined at this meeting also to work in harmony with the National Iron Buyers' Association, and a special committee will take up the matter with that organization. A central purchasing agency with power to buy for the various concerns in the association may be established. The Iron Buyers' Association is in receipt of an official letter from the interested lines in Southern territory, announcing that they cannot make any change in the prevailing rate to the Ohio River crossing, which is now $3.25, and still another meeting is to be held between the furnacemen in the Ironton and Wellston districts and the railroad men in the matter of rates on Coke shipments, to which the Columbus operators are to be invited. This meeting will be held in Columbus and will be subject to the call of Chairman T. D. Davant of the Norfolk & Western Railroad.

Pig Iron.—Inactivity has ruled the market, and dealers have had fewer actual transactions to record this week than for many weeks. Some Iron is being taken on old contracts and some small lots at bargain prices are going, but very little is heard of any round tonnage. Sharp competition has driven the price on Southern No. 2 to about $12, although such sales as have been made on this basis are conservatively regarded as furnace sales direct. The Northern product has also weakened, and while some agencies claim to hold firmly for $16, instances are cited of sales at a shaded price. There has been a fair inquiry for low grades, No. 3 Southern Foundry being quotable at $11.50 and Forge at $10.50. Sales of the week have been of a carload or so mainly, and anything approximating 1000 tons has been unknown. An inquiry from a Detroit melter is for a couple of hundred tons of Northern No. 3 Foundry. A northern Ohio concern wants 750 tons. A central Ohio Steel maker, who has recently purchased some Basic at a specially attractive price, is again in the market for April and May delivery. Charges of extensive cutting are made by some of the agencies, and some of the best informed local sellers predict lower levels, and soon, particularly on the Southern product. None of the agencies is willing to quote on the last half alone, but sales have been made extending into the third and fourth quarter and covering immediate requirements, and this price is said to approximate $12. For immediate delivery and balance of the first half we quote, f.o.b. Cincinnati, as follows, the rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	19.70 to 20.20
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	23.75 to 24.25
Lake Superior Car Wheel	22.50 to 23.00

(*By Mail.*)

Coke.—The little improvement recently noted concerning the movement of Foundry Coke has not abated, and the buying, although not large in individual cases, aggregates fairly well. There is practically nothing doing in Furnace grades. Prices have not changed. Connellsville Foundry is quotable at about $2.25 to $2.50, at oven, and Furnace grades at $1.75 to $2. Best Virginia grades range about the same. As a result of the meeting held in this city last week by furnacemen in the Hanging Rock District, another meeting is to be called in the near future, to which Columbus operators are to be invited, and the subject of freights and assembling charges from the ovens to the Wellston and Ironton districts will be again discussed.

Finished Iron and Steel.—The situation, if anything, is quieter, and beyond sales of a few Bars and some Sheets in small lots to blacksmiths and specialty people, the stores are doing little or nothing. Collections are better. Prices are unchanged. Dealers quote f.o.b. cars, Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c., base, half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy) No. 16,

carload lots, 2.15c.; small lots from store, 2.50. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light) Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—There is no activity in any line of the Scrap market. Dealers are inclined to predict still lower levels. The largest dealers have immense stocks on their yards, which they are increasing at present prices, believing when the reaction does set in the recovery will be rapid. Mills are still out of the market. The local market is about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.50 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	14.00 to 15.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Philadelphia.

PHILADELPHIA, PA., March 17, 1908.

Buying continues on a small scale and is confined almost entirely to such quantities as are needed for immediate requirements. Inquiries in some cases show an improvement, new buyers who have about used up their stocks coming into the market from time to time, but they are taking only moderate quantities, so that while there is an increased quantity of business, the actual tonnage placed does not show much improvement. The report that the several Steel works had not accepted the recent orders for 50,000 tons of Rails placed by the Pennsylvania Railroad Company is denied by the officials of the company. They say, however, that, owing to the new specifications under which the Rails are to be made, new prices will have to be agreed upon, and the adjustment of this price is still the subject of discussion. The officials of the same railroad deny the published reports that the company had begun work on repairs of a large number of its freight cars. Finished materials show some improvement, but the business which has been coming out is irregular, and day to day gains and losses about balance themselves, as is indicated by the fact that there is no appreciable gain in the output of mills. The financial situation shows a little improvement. Local banks reduced the discount rate to 5 per cent. last week, which is the lowest general rate made by the financial institutions since October of last year.

Pig Iron.—The tonnage of new business coming out is small in the aggregate, although a few lots of fair size have been recently placed. Buying is confined to small quantities for prompt shipment, although there is some inquiry for more extended delivery, covering as a rule the next three or four months. Some foundries are now getting rather bare of stocks and are buying more frequently. The demand during the week has been of a more general character. Foundry Irons continue as heretofore in the greater demand, but small tonnages of some of the other grades have been sold, and a little more inquiry with some small sales of Steel making Irons is noted. As far as forward business is concerned, buyers' and sellers' ideas seem pretty far apart. Consumers as a rule ask material concessions in price, which producers are not willing to make. Eastern furnaces are usually maintaining established rates. Some of the Virginia furnaces, which are not considered as being included in the present price arrangement, have held the established rates firmly. Others, however, still make lower quotations and have taken quite a fair tonnage, which under ordinary circumstances would to a considerable extent at least, have gone to the Eastern producers. Sales of No. 2 X Virginia Iron have been made in this territory at about $17.50, delivered, while No. 2 Plain has been done at a shade under $17, delivered. There have also been some offerings made, it is said, of Virginia Basic, under the ruling price for delivery in this territory, but this is not considered of particular interest owing to the variation in the analysis of the Iron made in the different districts. Sales of Foundry Irons are still confined to small lots, ranging from carloads up to a few hundred tons. The leading interests are still maintaining firmly at $18.25, delivered, for No. 2 X, and $17.75 to $18 for No. 2 Plain. The Pipe foundries are not as active buyers as they were, having covered pretty well on their larger requirements. One interest, however, has an inquiry in the market for 3000 tons of Pipe Iron, but the order will depend entirely on whether or not the foundry gets the business on which it is bidding. There has been a little more buying of Forge Iron, one sale of 500 tons and another of 600 tons being reported at full prices. Some inquiry has developed for Basic Iron, but buyers and sellers do not agree very well on the present price, and no business has yet developed. Scattered sales of Low Phosphorus Iron are reported. Tonnages, however, are small and for early delivery. Prices on this grade show no material change, sellers quoting $22.50, furnace, on small sized lots, but this would probably be shaded if a good tonnage came out. The following is the established range of prices for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, for the first half of the year:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—There has been a little more inquiry for Ferro. The demand, however, has been confined to small lots, with an occasional inquiry for a 100-ton lot. Orders are still scarce, and no business of any moment has been transacted. Quotations range from $44 to $46, Baltimore, the former for spot lots.

Steel.—Mills are just about able to maintain their former production, orders coming out not being numerous, and confined almost entirely to small lots for prompt delivery. Prices are unchanged, $30.40 being quoted for Ordinary Rolling Steel, with $32.40 to $33.40 named, according to analysis, for Forging Steel.

Plates.—While immediate business does not show much change, the outlook is considered more favorable. The placing of contracts recently for piers and wharfs in Baltimore will result in the purchase of some 3000 tons of Plates. Orders placed for Steel Pipe, which will require some 2000 tons of Plates, are expected to result in the purchase of that quantity from some of the mills in this territory. Day to day orders are small, and of a miscellaneous character, but the tonnage is sufficient in the aggregate to enable mills to maintain their recent rate of production. Prices are fully maintained, the following range being quoted for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G	.15
No. 9, B. W. G	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00

Structural Material.—Inquiries have increased slightly, although the tonnages asked for are usually small. Some little improvement is to be noted from week to week, however, and the trade feels more hopeful as to the future. A few buildings and bridges, averaging several hundred tons each, have recently been booked by mills in this territory, while several large building propositions are now being estimated on. Prices show no change, and are being fully maintained, 1.85c. to 2c. being quoted according to specification.

Sheets.—There is a little more business being taken by the mills, but not enough to enable them to make any material gain in production. Consumers order in small quantities, to meet immediate needs, and, as a rule, want prompt deliveries. The opening of spring is expected, however, to bring out an improved volume of seasonable business. Prices show no variation. We quote for mill shipment, with a tenth extra for small lots, the following range: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Old Material.—The market for Old Material is still greatly unsettled, and shows a further downward tendency. Buying is on a small scale, mills taking no interest in the market, and but little business is being done between dealers. Prices in the leading grades show a decline over those of last week. We quote about as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	12.00 to 12.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Bars.—The demand for Refined Iron Bars is extremely light. Consumers are buying in small lots to meet immediate needs only, and the amount of business taken by the mills is meager and does not enable them to make any

material gains on production. Prices are fairly well maintained, Refined Iron Bars being quoted by the leading mills at 1.65c., delivered, Philadelphia and adjoining territory.

Coke.—There has been a little more business done in Foundry Coke. Some contracts have been closed, but the tonnage taken has not been particularly large. Furnace Coke shows but little activity in this territory. Prices are unchanged. Furnace Coke is quoted at $1.75 to $2.25, at oven, with Foundry Coke at $2.25 to $2.75, at oven. For delivery in the Philadelphia territory prices range about as follows:

Connellsville Furnace Coke	$4.05 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.75 to 4.10
Foundry Coke	4.10 to 4.60

Potts & Wittman, Iron, Steel, Coal and Coke, North American Building, Philadelphia, announce that H. H. Seidel has formed a connection with them and will represent them in their business. He has for some years been engaged with L. & R. Wister & Co.

San Francisco.

SAN FRANCISCO, CAL., March 11, 1908.

While a great improvement is seen in local conditions since the money stringency checked many new enterprises last fall, there is still difficulty in raising funds for new projects, such as electric railroads, electric power plants and manufacturing and mining enterprises. Much capital is needed to set the wheels moving in these lines, which are essential to the prosperity of our rolling mills, foundries, engineering works, &c. Much Eastern capital could be invested profitably in long term loans at 6 or 7 per cent. interest. Business in Iron and Steel, Pipe, Sheets and Bars, which is still very quiet, will probably continue so until there is more money available. The local banks are disposed to be very conservative in loaning money for building or for new enterprises of any kind unless the security offered is exceptionally good. The outlook is bright for a good year in the mining districts, although the scarcity of money for improvements and extensions is still delaying operations in some districts of rich promise.

Structural Material.—No large contracts for Structural Steel were closed this week. Contracts are still pending for several Steel frame structures, however. The plans have just been announced for the construction of the new *Examiner* Building, covering an irregular shaped site, 96½ x 160 ft., on the southeast corner of Market and Third streets. The design, by Kirby, Petit & Green of New York, shows a 20-story Steel frame structure. It is to be as thoroughly fireproof as is possible for a building of its class. The partitions will be made of Steel studs and Wire lath. The fireproof ceilings will be unusually substantial. The construction of buildings is increasing, as shown both by the records of the building inspector and the filing of contracts. During the month of February 596 building permits were filed, with a total valuation of $2,685,292. In Oakland the February building permits totaled $729,000 and in Los Angeles $579,163. San Francisco stood third in the list of American cities in building construction on the basis of the February permits, its total valuation being exceeded only by New York and Chicago. Since January 1, 1907, the building contracts filed have aggregated more than $50,000,000, and it is estimated that about $100,000,000 has been expended in construction work since the fire.

Pig Iron.—Little improvement is noted in the local demand for Pig Iron. Stocks are ample for all requirements, although very little has arrived from Europe lately. Business is still comparatively light at most of the local foundries and engineering works, but repairs to steamers and machinery orders from the mining districts of the Pacific Coast are expected to cause considerable improvement in the situation this summer. The Union Iron Works is running its foundry and machine shop with a comparatively small force, owing to lack of orders for the construction of vessels. The company's uptown office has been moved from the Flood Building to a new building on the corner of Market and Pine streets. The Notre Dame d'Arvor has arrived from Newcastle, England, with 800 tons of Pig Iron for Girvin & Eyre, wholesale dealers. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted in this market at about $28 to $29 per ton, ex-yard.

Cast Iron Pipe.—While few contracts have been closed for Cast Iron Pipe this month there are inquiries for several lots aggregating about 1800 tons, and the outlook is good for the year's business in a conservative way. The United States Cast Iron Pipe & Foundry Company, through R. W. Martindale, Pacific Coast sales agent, has taken a contract for 278 tons of 6, 10 and 12 in. in diameter for use on the extensions of the distributing system of the municipal water works in Sacramento. The contract price was $34.85 per net ton. There were two other bidders. The Marin Water & Power Company, with its principal office at San Rafael, Cal., will soon vote on a bond issue of $2,000,000 for the extension of its system. The Los Angeles city authorities recently passed a resolution looking toward the calling for bids on the first section of the Owens River municipal aqueduct, involving the expenditure of the $3,000,000 raised by the issue of bonds. Concrete lined open and covered ditches will be used, and siphons will be put where valleys are crossed. The contract for Pipe casings and fittings for Kings Canyon was divided between Harper & Reynolds and the H. R. Boynton Company at $3314 and $6298, respectively. Prices of Cast Iron Pipe, f.o.b. cars San Francisco, are about as follows per net ton: 6, 8, 10 and 12 in., $38; 4-in., $39.

Merchant Pipe.—Sales of Steel Pipe are light and stocks in jobbers' hands are sufficient for the present requirements of this market. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel. Black. %	Steel. Galv. %
⅛ and ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
⅛ to ¾ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Sheets.—The general jobbing demand for both Black and Galvanized Sheets is light. The supply largely exceeds the requirements and manufacturers' agents are not trying to force the market. There is only a moderate amount of business locally in all of the lines requiring the use of Sheets, and it is difficult to say when there will be a decided improvement. Prices have been unchanged since the reduction announced in January. The many thousands of Galvanized Iron garbage cans that have been sold in this city since the sanitation campaign began have helped out many of the sheet metal shops that were short of contract work.

Mining Supplies.—The stampede to Rawhide, Nev., caused by the rich strikes that were recently made and the mining excitement in the new camp at Hart in Southern California have resulted in an increased demand for the necessities of life, but the market for Iron, Steel and machinery has not been much improved thereby. However, there are strong indications of a good year in mining throughout California and Nevada, and supply dealers are expecting to have their stocks reduced considerably a little later in the season.

According to advices from Spokane, Wash., contractors have begun work on the electric plant to furnish power for trains of the Great Northern Railway over the Cascade Mountains from Leavenworth to Skykomish. A Steel Pipe 1600 ft. long will be laid, running across the Wenatchee River and connecting with a large Steel pen stock 196 ft. high, holding about 1,000,000 gal. of water, to carry the water for the turbines, which will be directly connected to four General Electric polyphase generators. Each unit is expected to develop about 13,000 hp.

It is announced that the San Francisco, Oakland and San José Railway Company, which operates the Key Route system of electric railroads and ferry boats connecting Oakland, Berkeley and San Francisco, is to build a 50-mile extension to San José, as contemplated when the company was first incorporated. The earning capacity of this line and of the Oakland Traction Consolidated, which is owned by the same capitalists, is very large in proportion to the investment and the extension will undoubtedly be pushed to completion. Electric trains of from three to eight cars are operated by overhead trolleys.

The San Francisco, Oakland & San José Railway Consolidated has just been incorporated, with a capital stock of $7,750,000, to take over the San Francisco, Oakland & San José Railway and the San Francisco & Bay Counties Railway, a new concern with lines projected northward. The incorporators of the Consolidated Company include those of the two corporations just mentioned. The extensions to San José and elsewhere will be made by the new company, which will operate when completed a total of 81 miles of electric trackage.

The Southern Pacific Railroad Company announces that orders for rolling stock have been placed, and that the electrification of its local steam lines connecting Oakland with Alameda and Berkeley will be carried out within a year. It is probable that the electric lines will be extended south to Hayward, a distance of 14 miles. Two large turbo-generators for the company's electric power plant in Oakland are being constructed.

The Morgan Construction Company, Worcester, Mass., has been awarded the contract for an 18-in. continuous billet mill for the Pittsburgh Steel Company, to be located at the company's plant at Monessen, Pa. The mill will be equipped with Edwards flying shears and cooling table. Work on the mill will begin immediately, so that it will be ready for operation about August 1.

Cleveland.

CLEVELAND, OHIO, March 17, 1908.

Iron Ore.—Orders for shipment of Ore from the docks to the furnaces continue to improve from week to week, but the improvement is slight. Merchant Ore firms owning their own boats are making no preparations to fit them up for the opening of navigation. According to general opinion, little, if any, Ore will be shipped from the Lake Superior mines before June 1. No change has developed in the Ore situation as far as sales for 1908 delivery are concerned. No sales have been made, and consumers are not yet sufficiently interested in the matter to make inquiries. With enough last year's Ore to last them until late in the summer or longer, the majority of the furnace interests are expected to hold off for a number of weeks yet before closing new contracts. Some of the local Coal shippers have closed freight contracts in the past few days at the same rates that prevailed last season, but with the exception of a small amount several weeks ago there has been no chartering for Ore shipments and the rates for Ore have not yet been fixed. Chartering for Ore, however, will be light this year, for the reason that the leading firms that have used considerable outside boat tonnage the past few seasons will be able to carry all the Ore they ship this year in their own boats. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The past week has been as quiet as any in the past three months, as far as inquiries and actual sales are concerned. The only sales reported are car lots of Foundry Iron, and these sales have been comparatively few. Consumers are buying only for immediate needs, and there are no inquiries in the market for even 100-ton lots. While the market is almost stagnant, a better feeling prevails than has been noticed for several weeks. This is due to the fact that the majority of furnace interests report quite an improvement in shipping orders. The melt has increased somewhat in this territory, and a number of consumers report that the enlarged number of inquiries they are receiving make the prospects look considerably brighter to them. While there are reports of Iron being offered below the schedule, prices are being firmly maintained on the small sales in this immediate territory, there not being an inquiry for a large enough tonnage to test the market. While shipping orders are better, the furnaces still in blast are accumulating considerable Iron on their stock piles. Furnacemen expect that a number of consumers will be compelled to come into the market shortly. The demand for Southern Iron shows no improvement, and there are practically no inquiries. There are rumors of price cutting, but, according to reports, an offer by a consumer in this territory to take 1000 tons of No. 2 Southern at $12 was rejected. There are no inquiries for Basic Iron. A local interest is shipping about 2000 tons of Bessemer Iron per month to a Youngstown consumer. For prompt shipment and for the second quarter, we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—No sales of either Furnace or Foundry Coke are reported. Prices remain low. We quote Connellsville Furnace Coke at $1.70 to $1.80, at oven, for prompt shipment, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.40, at oven.

Finished Iron and Steel.—While there is a slight improvement in the demand for some lines, orders and specifications are still light. Some mills report a larger volume of orders, but they are all for small quantities. The only contract of any size reported during the week is for 2000 tons of Forging Steel Bars. The mill getting this contract also reports some good specifications on a similar contract closed the previous week. The demand for Plates and Sheets shows a slight improvement, but the orders are for small lots for immediate delivery. The Cleveland Steel Company, which has been shut down for three months, has resumed operations on double turn and hopes with the present volume of orders to keep running the greater part of the time. During the shutdown the plant has undergone extensive repairs and improvements and its capacity has been increased 50 per cent., although no additional sizes are being made. There are more reports of price cutting among smaller mills than there have been for some time. A concession of $1 per ton is reported in Sheets, and the price of Light Plates is being cut $2 a ton by two or three of the smaller mills. Iron Bars are weak and the demand is light. The price is being shaded to 1.40c., Pittsburgh. The demand for Steel Bars is light both on new orders and specifications. The price is being firmly maintained except on Steel specialties, on which small mills are cutting prices. Structural shops report an improvement in small orders, especially for fire escapes, the recent Collinwood disaster having stirred up municipalities to have buildings more generally equipped with fire escapes. The general Structural outlook, however, is far from satisfactory. As a rule projects requiring a fair amount of tonnage are being held back, and unless they develop soon it is not believed that they will be carried out this year. It is understood that the Lake Shore Railroad Company will go ahead with some bridge work this season that will require from 5000 to 10,000 tons of material, but there are no reports of other bridge work projected by railroads in this territory. There is still some demand for Light Rails in car lots for coal mines. The price is being shaded to meet the competition of rerolling mills. Warehouse business shows only a slight improvement, and the stock price on Iron and Steel Bars is being shaded on good orders. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The warehouse price on Steel Bars is 1.75c. to 1.85c., and on Iron Bars, 1.75c. to 1.80c. Beams and Channels from store are 2.10c. to 2.15c., base. Store prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount. The city of Toledo has closed a contract with the United States Cast Iron Pipe & Foundry Company for 600 tons of Pipe for its Water Works Department.

Old Material.—While some dealers report a slight improvement in inquiries, the market has been absolutely dead as far as actual sales are concerned. Prices remain nominally stationary, but show a tendency toward further weakness. Dealers are looking for a slight improvement in the demand, but do not expect much change in prices. The Baltimore & Ohio Railroad is offering a list of about 4000 tons which will be closed this week. Dealers' prices to the trade, which are unchanged, are as follows, per gross ton, f.o.b., Cleveland:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	15.50 to 16.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 11.50
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	8.00 to 9.00

Birmingham.

BIRMINGHAM, ALA., March 14, 1908.

Pig Iron.—The level of prices seems to have settled around a basis of $13, Birmingham. Notwithstanding the fact that buying has not been stimulated to an appreciable extent, melters find it necessary to make frequent purchases, and the aggregate of tonnage engaged shows the market to be in better condition than is indicated by general appearances. At least four concerns are practically out of the market for first half deliveries, and the demand is being met by leading interests who have manifested most reluctance in making concessions in prices. The statement that the output of producing capacity now in operation is equivalent only to order-book requirements is substantiated by the fact that accumulations on furnace yards are being gradually reduced. The largest single accumulation in the district is practically depleted. Reports of offerings at figures below the established quotations are less frequent, and within the week bona fide offers for approximately 1000 tons have been refused by reason of a difference of 50c. per ton in the price offered and quoted. It is true that buyers manifest a disposition to pursue a conservative course as to negotiations, and the demand is such as hardly to test the strength of the market, but producers appear to be willing to accept the situation as presented, and, like consumers, are disposed to await further developments. The general foundry trade displays some improvement, yet the melt does not increase materially, and despite the encouraging outlook for Pipe manufacturers, the idle capacity is not decreased. Furnace stacks that are idle are being put in good condition, however, and no doubt production could be made to meet an increased demand on short notice.

Cast Iron Pipe.—With the approach of a favorable season, proposed improvements and extensions to water works systems are more numerous, and the new business reasonably expected to develop is gratifying. The principal new letting reported is 3000 tons for the city of Milwaukee, Wis., but a number of smaller lots will be placed upon the

satisfactory disposition of municipal bonds. Among the contracts placed during the week were 500 tons for Seattle, Wash., 800 tons for Grand Rapids, Mich., and approximately 500 tons each for Rockford, Ill., and Ft. Wayne and Evansville, Ind. These orders were fairly well distributed among producers, which would indicate firmer quotations. However, prices recently made on larger contracts were very much at variance, and we continue to quote nominally. Nominal quotations on Water Pipe, f.o.b. cars here, are as follows: 4 in. to 6 in., $27; 8 in. to 12 in., $25; over 12-in., average, $24, with $1 per ton extra for Gas Pipe.

Old Material.—The condition of the market is practically unchanged. Quotations are being adhered to, and an attitude of independence is generally displayed by dealers, yet the business offered would hardly be increased by concessions in prices. The sale of bargain lots is the feature of the market, and prices received are considerably at variance. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.50 to 11.00
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 11.00
Cast Borings	6.00 to 6.50

New York.

NEW YORK, March 11, 1908.

Pig Iron.—The market for Foundry Irons is very quiet, and lower offerings are being made by some Southern sellers, both in this territory and in New England. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.25 to $18.75; No. 2 Foundry, $17.50 to $18; No. 2 Plain, $17 to $17.50. Southern Irons are $17.25 to $17.75 for No. 1 Foundry and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—No new business of any consequence has been placed during the past week. It is understood that negotiations with reference to the price to be paid for Rails under the Pennsylvania specifications are still in progress.

Structural Material.—Contracts for buildings and bridges are few and comprise only small quantities. In this city the Hay Foundry, Newark, N. J., has taken contracts for the erection of a loft building at Broadway and Fourth street, 1600 tons, and a building for Henry Corn at Fifth avenue near Forty-second street, 1000 tons. Local bidders had expected to secure a 12-story building to be erected at Seattle, Wash., requiring 1500 tons of Steel, but the contract for the erection of this building has been placed with the Brown-Ketchum Iron Works, Indianapolis. Another Seattle building, which is at first to be three or four stories in hight, and will eventually be expanded to possibly 18 stories, is practically secured by the American Bridge Company. The Chicago, Milwaukee & St. Paul Railroad gave out 1000 tons of bridge work, half of which went to a bridge company at Roanoke, Va., and the other half to a company at Pittsburgh. Quite a number of railroad companies are in the market for bridge work, but in nearly all cases the quantity to be purchased is small. A contract for 700 tons placed by the Manufacturers' Railroad, St. Louis, is understood to have been secured by the Cambria Steel Company. Financial conditions are holding back some projects in the building line which looked promising quite recently. Those who have the capital or are able to secure it can now build at a cost of 10 to 15 per cent. less than a year ago, and those who can command the necessary funds will hardly allow this opportunity to slip past them. Fabricators are taking work at cost, or even below it, to keep their forces together. One important item which is cutting a figure in work of this kind is that labor is now much more efficient than it has been, prominent contractors stating that they are securing from 20 to 30 per cent. more work out of the same number of men than during the busy period of last year. Mills rolling Structural Shapes are securing considerably more business than for several weeks, which indicates that the consumption in this line is increasing. Prices continue to be quoted as follows on mill shipments, tidewater delivery: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Consumers and jobbers are confining their purchases to cover their immediate requirements. As far as can be ascertained, no contracts are being placed for forward delivery. Purchasers feel assured that prices in the near future are not likely to be higher, and they have no inducement in increased business to lay in stocks or cover their expected needs. Prices are maintained at 1.50c., Pittsburgh, or 1.66c., tidewater, on Bar Iron, and 1.60c., Pittsburgh, or 1.76c., tidewater, on Steel Bars. The Bar manufacturers will meet this week for their usual monthly consideration of trade conditions.

Plates.—Inquiries are few, as consumers of Plates in this vicinity are doing little new work, and even their repair business is not large. Prices are unchanged as follows on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of Ithaca, N. Y., has opened bids on 500 tons, the lowest being about $23.50. The city of Rome, N. Y., will shortly purchase 4000 tons, and is now asking for bids. The order for 772 tons recently placed by the city of Grand Rapids, Mich., was awarded at $22.90, delivered, which is said to have netted the successful bidder $18.30, at foundry in the South. This is claimed to have been the lowest price realized on Pipe since prices began to recede. The general demand is exceedingly quiet, even orders for small lots being few. Carload lots of 6 in. are quoted at $23.50 to $24 per net ton, at tidewater.

Old Material.—Railroad lists recently put out have been quite heavy, and as they have gone to many consumers this has naturally interfered to some extent with sales by dealers. The general market has therefore been decidedly quiet, with sales of scattering lots of foundry stock and a little rolling material, almost exclusively for immediate use. Consumers are limiting their purchases to their daily needs and are not anticipating their requirements to any extent. Prices are nominally about the same as have recently been quoted, but buyers may be able to shade prices on some grades of material 25c. to 50c., especially if dealers are found who are desirous of moving material. Wrought Scrap is stated to be notably weak. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	10.00 to 11.00
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Iron and Industrial Stocks.

NEW YORK, March 18, 1908.

The past week has witnessed increased activity in the stock market. Conditions have been buoyant, and notable gains have been made in the price of practically every railroad stock, as well as all of the iron and steel stocks. This condition of affairs was brought about by rumors of a more favorable character regarding the attitude of the administration toward business interests, as well as by reports of better conditions financially and commercially. It is possible that some of the reports regarding improvement in business have been too strong, and that cold facts as they come along may have too great a corresponding effect in depressing prices. Heavy profit taking occurred on Monday, causing a recession to set in, which continued part of Tuesday, when the market again turned upward. An exception to the general course of the market was in Crucible Steel, which declined sharply with the passing of the preferred dividend. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 32⅝ to 34¾, preferred 95½ to 98⅜; Car & Foundry common 28¾ to 30⅞, preferred 88½ to 90; Locomotive common 36¼ to 38¾, preferred 90½ to 91½; Steel Foundries common 5¼ to 5¾, preferred 30¾ to 31; Cambria Steel 28¼ to 29¾; Colorado Fuel 18 to 21; Crucible Steel common 4¾ to 5⅛, preferred 34½ to 37½; Pressed Steel common 21⅛ to 22¾, preferred 78 to 80; Railway Spring common 31½ to 33½; Republic common 17¼ to 18⅞, preferred 69 to 74; Sloss-Sheffield common 46¼ to 51¼; Cast Iron Pipe common 19⅝ to 21½; Can common 5, preferred 48 to 50. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 33¼, preferred 97; Car & Foundry common 30, preferred 90; Locomotive common 37¾, preferred 91; Colorado Fuel 20; Pressed Steel common 22¼, preferred 79; Railway Spring common 33¼; Republic common 17⅞, preferred 72½; Sloss-Sheffield common 50; Cast Iron Pipe common 21, preferred 67½; Can common 4¾, preferred 47⅝, ex-dividend.

The Crucible Steel Company of America has issued a statement for the six months ending February 29, 1908,

which shows a net profit for the half year of only $174,132.91 before charging off adjustments of inventory values. November showed a loss of $13,865.48; December, $56,729.40; January, $23,070.13; February, $42,324.86. The profit in September and October was $313,558.79. The deficit for the half year, after charging off adjustments of inventory values and paying a dividend of 1 per cent. on the preferred stock, was $496,524.09. The action of the directors in passing the dividend for the current quarter was commendable. The company's surplus February 29 was $1,960,759.72.

The adjourned special meeting of the American Steel Foundries, which was to have been held March 14 in Jersey City, was again adjourned, this time to April 18. No business was transacted, but after the adjournment Judge E. H. Gary, one of the committee which drafted the stock readjustment plan which is to be acted on, made a statement to the stockholders. He said that at the present capitalization it would be years before the company could pay dividends. The company has a good business and its prospects are bright, but dividends cannot be paid unless there is a surplus. The directors of the company had considered the stock reduction plan very carefully, he said, and if it was carried out the present holders of preferred stock would have 70 per cent. of the control of the company, but the holders of common stock would get substantial benefits. The plan, to which 75 per cent. of the stockholders have consented, would make the stock of the company intrinsically valuable.

The special meeting of the stockholders of the Alabama Consolidated Coal & Iron Company, which was to have been held in Jersey City March 14 to act on the proposition to issue $1,750,000 third mortgage 5 per cent. bonds, has been indefinitely postponed for lack of a quorum.

Dividends.—Manning, Maxwell & Moore, Inc., have declared the regular quarterly dividend of 1½ per cent., payable April 1.

The American Iron & Steel Mfg. Company has declared a quarterly dividend of 1¼ per cent. on the common and preferred stocks, payable April 1.

The United Shoe Machinery Company has declared a quarterly dividend of 1½ per cent. on the preferred stock and 2 per cent. on the common stock, payable April 4.

The Union Switch & Signal Company has declared a quarterly dividend of 3 per cent. on the common and preferred stocks, payable April 10.

The Washburn Wire Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable April 1.

The Standard Screw Company has declared a quarterly dividend of 1¾ per cent., payable March 31.

The E. W. Bliss Company has declared the regular quarterly dividend of 2 per cent. on the preferred and 2½ per cent. on the common stock, payable April 1.

The International Nickel Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable May 1.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

Metal Market.

NEW YORK, March 18, 1908.

Pig Tin.—A fair American demand, largely for forward delivery, stimulated the London market, and prices are over 1c. higher than a week ago. The total turnover during the week is estimated at above 500 tons, which is about 60 per cent. of normal. Price changes during the week have been as follows:

	Cents.
March 11	29.20
March 12	29.50
March 13	29.90
March 14	30.00
March 16	30.75 to 30.85
March 17	30.50 to 30.60
March 18	30.50

Apparently there is sufficient spot metal to meet the demand, but, as has been the case for a year, supplies are concentrated in a few strong hands. Much of the week's buying is believed to have been semi-speculative. The London market is over £4 higher than last week, at £138 5s. for spot, and £135 17s. for futures. The arrivals are 3257 tons, and there are afloat 1689 tons, of which about 300 tons will make this month's delivery and 600 tons may possibly arrive March 31.

Copper.—Considerable metal has been sold for domestic consumption, but nothing like the extravagant claims made by some of the daily papers. The American market is and has been dominated by the London market, and as long as the chief outlet is abroad this will continue. Sales have been made at 13c. for both Lake and Electrolytic, but in view of the higher prices abroad to-day 13.12½c., would probably be asked for high grade Lake. Exporters can secure metal at slight concessions, but 13c. has been paid for Electrolytic for export. Good Casting Grades can be had at 12.75c. to 13c. Consumption in this country is still at a low ebb. A leading electrical apparatus manufacturer is using about 35 to 40 per cent. of normal, and wire drawers 25 per cent. and even less. No great improvement in prices is anticipated until the wire trade shows signs of picking up. Considerable price cutting is noted in finished lines, such as Brass and Copper Sheets. European buyers are covered for at least six weeks, and therefore are not likely to bid freely on an advancing market. The March exports so far amount to 11,408 tons. In London prices close this afternoon about £1 10s. higher than last week at £59 2s. 6d. for spot and £59 10s. for futures. Best Selected is held at £62 5s.

Pig Lead.—An advance of 15c. by the American Smelting & Refining Company March 13 was followed by one of 5c. the next day, and another of like amount March 16, bringing the price to 4c., New York, and 3.85c., St. Louis. This is the highest price since November. Considerable business was stimulated. Paint manufacturers are reported to have a good run of trade. No shortage of Lead, however, is probable in the near future.

Spelter.—Little or no improvement is noted in the demand here, but Steel manufacturers are buying a little more freely. Prices are a trifle firmer at 4.75c. to 4.80c., New York, 4.70c. being refused for a round lot. In St. Louis prices are also higher at 4.60c. to 4.65c.

Ferroalloys.—More inquiries for Ferroalloys are in evidence than for some weeks. Several are in the market for fair sized tonnages of Ferromanganese, also for a few cars of 50 per cent. Ferrosilicon. A Steel manufacturer was in the market this week for a few cars, and it is understood that a price equivalent to about $80, Pittsburgh, was paid for 50 per cent. Ferrosilicon. There is still some irregularity in the price of 80 per cent. Ferromanganese, and rumors are heard that $44, at seaboard, is being shaded. Continental brands are offered at lower figures.

Aluminum.—The principal producer adheres to the old quotation of 33c. for No. 1 ingots, and 31c. for No. 2 ingots, but it is understood that metal can be imported in large quantities at lower prices. Business is light.

Antimony.—The dullness prevailing for several months continues, and prices are nominal, at 9.50c., for Cookson's, 9c. for Hallett's, and 8.50c. for outside brands.

Nickel.—Quotations are unchanged, at 45c., for ton lots, and 55c. to 60c. for smaller quantities.

Tin Plate.—Additional mills have resumed operation, and the Tin Plate trade continues the brightest spot in the metal line. Prices are unchanged, at $3.89, New York, and $3.70, Pittsburgh. A rather sharp advance of 3d. brings the price of Welsh Plates, in Swansea, to 12s. 4½d.

Old Metals.—Some improvement is noted, chiefly in sentiment and prices, to correspond with the advance in Copper, but the volume of business is small. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.25 to 12.50
Copper, Heavy and Wire	12.00 to 12.25
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.25 to 9.50
Brass, Light	7.25 to 7.75
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.25
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.65
Lead, Tea	3.40
Zinc Scrap	3.50

The Great Northern Ore Properties.—The trustees of the Great Northern ore properties have reported to stockholders the results of the operation of the trust formed to hold these properties for the year ended December 7 last, the first year of its existence. The total amount received by the trustees was $1,650,000. Administration expenses were $67,750 and the distribution to stockholders of a 1 per cent. dividend called for $1,500,000, so that the balance of undistributed income at the close of the year was $82,250. The trustees say that in addition to the 39,000 acres of ore lands leased to the United States Steel Corporation the trust holds stock in companies which control by lease or ownership an additional 26,000 acres of ore lands. Under the leases made prior to December 7, 1906, the date of the creation of the trust, there were mined and shipped during the past season 3,307,000 tons of ore. No mention is made of the amount mined for the Steel Corporation.

The Wm. B. Scaife & Sons Company, Pittsburgh, has received an order from the American Iron & Steel Mfg. Company, Lebanon, Pa., for a 25,000-gal. per hour We-Fu-Go water softening and purifying system. It is to be ready for operation about June 1.

The Manufacture and Upkeep of High Speed Steel Milling Cutters.

At the December meeting of the Institution of Mechanical Engineers, held in London, Dr. H. T. Ashton read a paper entitled "Notes on the Manufacture and Upkeep of Milling Cutters." Dr. Ashton is connected with the Royal Small Arms Factory at Enfield Lock, England. While his methods are of general application, they have been developed more particularly to extend the usefulness of the high speed steels, especially when applied for cutting to give an accurate finish and a good surface.

In discussing the advantages of using high speed steels for milling cutters, he pointed out that they not only keep a cutting edge for a reasonable time when taking very heavy cuts at a previously unattainable speed; but they also keep their cutting edge much longer than ordinary steel tools, when used with moderate cut and speed. The milling cutter is the most expensive tool used in cutting metals. In the simplest cutter, the cost of workmanship so greatly exceeds the cost of material that a moderate increase of life obtained by improvements in the raw material far outweighs a considerable increase in its original cost.

It is desirable that cutters should have as long a life as possible in actual service, not only to minimize the first cost and upkeep, but to keep the output of the machines as constant as possible, by freedom from delays in changing the cutters. These points chiefly depend upon: The quality of the steel from which they are made; the method of hardening adopted; the care and accuracy with which the new cutters are made, and the facility and correctness with which the cutters can be ground.

Annealing the Blanks.

For the raw material, any of the well known classes of steel can be used. Before cutting, the blanks must be annealed, and the method adopted is to pack them in spent powdered charcoal and steel turnings in cast iron pans, with covers which can be luted close. The boxes are slowly heated to from 700 to 750 degrees C. (1292 to 1382 degrees F.), the time being about five hours, are held at this temperature for about four hours and are then allowed to cool gradually for 48 hours. While some of the high speed steels are satisfactorily annealed by the makers, it is generally best to apply the above treatment to insure thoroughly satisfactory results.

The accuracy of the form of the cutters, both when being cut in the first place and also subsequently reformed, is secured by turning the blanks and milling out the teeth in the ordinary manner, and then backing off the teeth in a machine illustrated and described in the paper.

Hardening the Cutters.

The hardening is done in a coke fired furnace, with a forced draft. This has been found especially adapted for obtaining a soaking heat, together with the high temperature necessary in treating this class of steel. The cutters are packed closely in powdered charcoal in sheet steel boxes about 6 x 6 x 3 in. These boxes take from two and three-quarters to three hours to reach the necessary hardening temperature, the time taken varying with the weight of metal to be heated. The hardening temperature varies somewhat according to the class of steel used, but is usually between 2000 and 2100 degrees F. The exact temperature necessary for satisfactorily hardening any particular class of steel is previously determined, and the temperatures of the hardening furnace are checked by means of a Féry radiation pyrometer.

The cutters when sufficiently heated are quickly removed from the charcoal and are at once placed upon the hardening table, which is of a type frequently used in workshops for heating tools by gas. In this case only air is supplied through two nozzles. These can be moved as required through vertical pivots, so as to cause the air blast to inpinge upon the periphery of the cutters at any required point, and simultaneously upon the vanes of a spindle upon which the cutter is placed. This causes the whole arrangement to rotate and equalizes the cooling and hardening effect. The cutter will last longer if the heat to which it was raised before hardening was such that the steel just began to fuse. The surface must just show signs of running. Though different makes of steel have been found to vary somewhat in this respect, the general statement remains true of them all. At the same time it is found that this fusing effect for a given heat is considerably minimized by the method of heating in closed boxes, as compared with the ordinary method of heating either in a muffle or a direct gas flame. Even the scaling, which with the latter systems is frequently very marked, is, with the method now described, so slight that the cutters can be wholly freed from scale by placing momentarily under a revolving scratch brush. Allowance is made for the expansion of the hole by leaving the bore slightly smaller than is required. On the average about 0.01 in. less than the finished diameter. After hardening the cutters are placed in a self-centering chuck and the internal bore is ground true to size.

Grinding the Teeth.

Special grinding machines are used for sharpening the cutting edges and subsequently regrinding their faces or edges as required from time to time. The life of some milling cutters prepared by the methods indicated above has been extraordinary. For example, a cutter has been working in an automatic cross milling machine on the bodies of the surface rifle. The composition of the steel is from 0.5 to 0.6 per cent. carbon and the ultimate stress not less than 78,000 lb. per square inch. With an average cutting speed of 69 ft. per minute, a feed of 1¾ in. per minute, a depth of 0.08 in., and taking a cut of an average width of 1 11-16 in. and ⅞ in. long, this cutter has produced, at the present time, 39,170 bodies, and is still good for about half as many more.

In the reply to the discussion Dr. Ashton said that the main virtue of the charcoal used in hardening was that it gave a nonoxidizing atmosphere during the heating, and being, comparatively speaking, a nonconductor, allowed of a uniform slow heating. If the steel was carbonized it was probably to such a slight extent that the thin skin was removed during the grinding operation.

G. B. W.

Gas Engines for a Steel Foundry.—The Duquesne Steel Foundry, which operates a large plant in the Pittsburgh District, has decided to adopt the gas power system to operate the works formerly driven by steam. The initial equipment will consist of a 400-hp. Westinghouse gas engine of the three-cylinder vertical inclosed type, directly connected to a 240-kw. generator, which will serve the various motor drives around the plant. The plant will operate on natural gas, which is available at such low rates as to render gas power the cheapest form of power available in that section of the country.

The Pennsylvania Railroad Company has completed and put in operation a terminal line connecting with its new ore docks and ship canal at South Buffalo, N. Y. The new line, which is 7 miles in length, permits the carrying of freight around instead of through the crowded Buffalo yards, and will prove of great value in moving ore, coal and other freight which is transported over the lake and rail routes. The company's South Buffalo ore dock has a capacity of 1,000,000 tons, and is equipped with electrically operated devices loading 500 tons per hour into cars on the track.

The best 24-hr. record at the Ensley blast furnaces of the Tennessee Coal, Iron & Railroad Company was made Saturday, when four stacks produced 1365 gross tons of pig iron. An average of 341 tons, the best previous day's record, was made in May last year, when five furnaces produced 1353 tons, an average of 270 tons. The Ensley rail mill made a record of 1525 tons March 12, and if the rate of the past two weeks is maintained, it will produce 30,000 tons of rails this month. This mill will shut down April 1 for the installation of new finishing trains and of a new roughing mill and engine.

The Machinery Trade.

NEW YORK, March 18, 1908.

The demand for machinery the past week was very light, with both inquiries and orders small in volume and no indication of an immediate resumption of activity. Trade appears to be lifeless, and transactions covering more than two or three tools are exceptions. Some fair business has been received for export and from the Government, without which trade with some houses would be extremely dull. Second-hand machinery is in better demand than new, but this is not unusual during a business depression, when buyers prefer to supply their wants at a minimum cost. Manufacturers of large power equipment are faring better than machine tool builders at the present time, because of the number of municipalities which are installing new lighting plants and water works or enlarging the present plants. There has been a decided falling off in building operations in and near New York during the last few months, and as a consequence the demand for small power equipment is not as large as it was, but with the coming of spring it is expected that business in that line will pick up to some extent, and some inquiries now in the market indicate that there will be a resumption of construction work within the next few weeks. The demands for power accessories and parts of machines has been quite brisk, which is taken as an indication that many manufacturers are taking advantage of the dull times to make needed repairs.

Few large projects are showing signs of activity, and though spring is at hand companies which have held important work in abeyance for some time are not inclined to proceed with their plans until there is a decided improvement in business. The railroads are doing practically nothing in the way of shop construction and purchases of machinery, the activity in the trade being confined almost wholly to the smaller establishments. Of the larger work, a determined effort is being made to start the construction of the Lexington avenue subway in Manhattan and the Fourth avenue subway in Brooklyn, with every likelihood that work will be commenced this summer. A plan has been brought forward for the construction of the subways in sections, and it is possible that contracts for the first section of each subway will be let within the next few months. The Public Service Commission has laid out and approved plans for both routes and is ready to let contracts as soon as it receives permission from the Board of Estimate.

Preliminary inquiries placed in this market indicate that it will not be long before work of constructing a tunnel under the Delaware River, from Philadelphia to Camden, will be commenced. A suit directed against the project, which was brought in the New Jersey courts, has been settled satisfactorily and the syndicate organized by Philadelphia bankers to start the work has engaged the Philadelphia engineering firm of Stearns & Castor to make estimates on the job. The project will include the construction of subways under a section of both cities, each about one-half mile in length, and twin tubes under the river 2700 ft. long. The plan will also necessitate the erection of a power house, and although the work will not compare in size to any of the tunnel projects to connect New York with other shores, it is safe to assume that there will be a good deal of equipment bought.

Contract No. 9 for work on the Erie Barge Canal has been awarded to the Thomas Crimmins Construction Company, New York, at its bid of $755,995. The work to be done covers 5½ miles near Medina, Orleans County, N. Y.

A local machinery man who is close to railroad affairs recently returned from a trip through the South and East with some more encouraging reports regarding the outlook than the trade has had in several weeks. He stated that a number of railroads in the South are preparing to do some buying, and at least one road will come into the market before long for a large quantity of machine tools, while others will make purchases for additions needed for their shop equipment. Some of the New England railroads will also come into the market shortly, it is thought, for repair equipment, and while none of them have lists, from all accounts there will be considerable scattered buying. The New York Central Railroad continues to place some orders for its West Albany shops, mostly in the line of conveying equipment and power accessories.

The South & Western Railroad Company, Johnson City, Tenn., has filed papers in Nashville changing its name to the Carolina, Clinchfield & Ohio Railroad Company, with increased capital stock from $7,000,000 to $27,000,000. The increase of capitalization evidently means that the company, which now operates 67 miles of road from Johnson City, Tenn., to Alpapass, N. C., intends to go ahead with its projected 285 miles. It will be remembered that this company's small shops at Carnegie were destroyed by fire a few weeks ago, and that the company intends to erect main shops for the heavy repairs some time this year, the location for which has not been selected. Negotiations are under way for the property, and it is likely that plans for the buildings and construction work will be started within the next few months.

It is stated that the Michigan Central Railroad has purchased 110 acres of land at Kalamazoo, Mich., located between the tracks of the Chicago, Kalamazoo & Saginaw Railroad and the Kalamazoo River, and that the company intends to move its shops from Jackson and Michigan City, consolidating them on the new site. It is understood that the shops will not be moved this year, but that during the next few months plans will be perfected and operations started some time during the summer. It is planned to leave only a few small shops at Jackson for repair work and to construct the shops at Kalamazoo for heavier work.

Important Pumping Engine Orders.

The largest orders for pumping engines placed in this market in some time were given out last week by the National Transit Company, one of the subsidiary interests of the Standard Oil Company, for its Oil City, Pa., plant, where some extensive improvements are being made. The orders were placed by F. M. Towl from the office of the Standard Oil Company, 26 Broadway, New York, and included 20 three-cycle triplex expansion double acting pumping engines, the steam cylinders 20½ in. and 38 in. and 54 x 36 in. in diameter, with a piston cylinder 5 x 36 in. The orders aggregated an expenditure of about $300,000. Ten of these engines were ordered from the Snow Steam Pump Company and the order for the other 10 was placed with the Maryland Steel Company. It is expected that there will be some other buying for the Oil City plant, and it has been announced that a large sum will be spent in the shops there, as the improvements will include an addition to the machine shop, 130 x 200 ft., and a new foundry, 70 x 300 ft.

The Fuller Engineering Company, Allentown, Pa., has been awarded the contract for the construction of a 3000-barrel Portland cement plant at Courtney, Mo., for the Blue Seal Portland Cement Company. No time has been set for starting the construction of the plant, and it is not likely that the equipment will be purchased until building operations have been commenced. The offices of the Blue Seal Portland Cement Company are in the Scarritt Building, Kansas City, Mo.

The Elkins Power Company, Elkins, W. Va., which is to erect an electric light and power plant, to be equipped with engines, generators and other machinery at a cost of about $30,000, will purchase a complete equipment of from 500 to 600 kw. capacity.

There are inquiries in the market for about 200 hp. of equipment for a factory which is being rebuilt at 129 Degnon avenue, Brooklyn, for E. B. Jordan & Co.

Business Changes.

The United Gas Machinery Company has been incorporated under the laws of the State of New York to take over the business formerly conducted by Thomas F. Fitzsimmons, 100 Broadway, and will manufacture and market a complete line of gas generators for making producer gas for gas engines and heating and water gas for high temperature furnaces, forges, annealing, &c. The company has offices in the Engineering Building, 114-118 Liberty street, New York, and Thomas F. Fitzsimmons is the president and general manager.

Chicago Machinery Market.

CHICAGO, ILL., March 17, 1908.

Machinery interests, in common with those in other lines of manufacture, are bending their efforts to make the best of present conditions and to that end are carefully canvassing the field in search of business, either immediate or prospective. The conditions of 1906 and the early months of 1907 are reversed and the seller is now seeking the buyer, instead of the latter searching for those of the former who were in position to furnish the goods. No striking change is observed in the volume or character of business developed during the past week. Some of the machine tool dealers have noted a moderate increase in trade for the week, while others report somewhat less activity, but it is fair to assume that the general average holds fairly even. Several good sized millers were included in the shipments made, which were widely distributed, orders mainly covering only single tools. Demand is principally confined to two classes of buyers, represented by the small shops, which are adding a tool here and there, and newly organized enterprises requiring shop equipment. The latter are, of course, comparatively few, but some investors with an eye to the future regard the present situation as favorable to the building and equipping of plants where funds are available for the carrying out of such plans. There is, however, nothing of importance on foot looking to the extension of established plants, either in

building or equipment. The scattering orders that are received from such sources are pretty generally confined to occasional purchases for replacement of obsolete machines. Inquiries are reported not only to be increasing in number, but are of a firmer nature than heretofore, holding out a better promise of concrete results.

The recent placing of an order for 300 electric cars by the Chicago City Railway is of special interest to the manufacturers of electrical and air brake equipment. This order represents only a part of the requirements of this company which will be needed to carry out plans for the rehabilitation of its line. How many more cars will be required is not yet determined, but in addition to those now in service which may be remodeled, it is certain that orders for a considerable number of new cars will be placed later on.

Nothing indicative of an early resumption of activity by the Frisco System respecting the purchase of tool equipment for its new shops at Springfield, Mo., has developed. It will be recalled that bids on this important list were submitted last fall, but no purchases were made, and since that time the whole matter has been in a quiescent state. Just when it will again come into the market is undetermined.

Jos. Cody & Sons, Peoria, Ill., have in contemplation the erection of a new boiler shop during the coming season. It is their purpose to build a shop 100 x 200 ft., of steel frame construction, which will be equipped with modern tools, including rolls, punches, shears and pneumatic tools. For the more economical handling of work in general and for the execution of a contract recently taken for 1000 steel pressure tanks for individual house water systems, improved facilities are required. Plans for this improvement will be completed in the early spring.

The Noxall Mfg. Company, Seward, Neb., has been incorporated, with a capital stock of $50,000, to manufacture the Noxall seed and grain graders and cleaners. Only a part of the necessary equipment has been purchased. The machines already bought include saws, sand drums, planer and gasoline engine. The incorporators are Thomas J. Hatfield, Frederick N. Wullenwaber and Daniel J. Hartrum.

The plant of the Fred M. Prescott Pump Company, Milwaukee, Wis., has work enough in hand to keep a full day shift actively employed. A fair amount of new business continues to develop, a good portion of which is coming from mining interests.

About $30,000 will be expended in alterations and improvements to the municipal electric light plant, Carlyle, Ill. These will include a 30 x 60 ft. addition to the power house and additional generator and engine, and one 250-hp. boiler, and pipe for the extension of water mains, plans for which are now being prepared. G. H. Berger is Mayor of the city.

For the betterment of its service the city of Crawfordsville, Ind., is contemplating alterations in and improvements to its municipal electric light and power plant. The nature and extent of these improvements will be determined as soon as a consulting engineer has been selected to formulate and submit plans.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 17, 1908.

While the volume of new business in the tool and machinery trade continues comparatively small, there is a little more inquiry for the medium and smaller class of tools. Although it is difficult in many cases to get inquiries turned into orders, the trade feels more encouraged as to the ultimate volume of business which will come out in the near future. Under ordinary circumstances there is an improvement in the trade in the early spring months, and while it is not expected that the volume of business this spring will be as large as is usually the case, it is believed that some improvement over the existing conditions will be noted. Practically all of the business placed recently has been for single tools and largely of a miscellaneous character. Sales of lathes of the smaller sizes, medium sized drills, an occasional milling machine, or a grinder, together with some classes of the smaller special tools, make up about the usual range of business transacted. As buyers are placing orders only for tools absolutely needed, the delivery desired is usually prompt, which can be had without difficulty in almost every class of the so termed standard tools, as stocks both in manufacturers' and dealers' warehouses are heavier than they have been for a long time.

As far as manufacturers are concerned, the situation shows little change. Sales by dealers do not aid them to any material extent, as the tools disposed of, which come out of stock, are not usually covered by renewal orders, as most of the dealers already have stocks much larger than they wish to carry, and frequently still have tools due them from the makers. Tool builders continue to operate plants in a rather restricted fashion, and orders coming in are hardly sufficient to keep them going even with the present reduced forces. Locomotive builders and other large industrial concerns report no material increase in business, as the railroads still maintain their policy of remaining out of the market. Until these various industries begin to see an improvement in conditions and become more active buyers themselves, the machine tool trade will likely continue on a rather unsatisfactory basis.

The demand for second-hand tools and machinery shows some little improvement. There is a better inquiry for the medium sized tools, and some dealers report sales of rather fair size. In one instance a complete shop equipment was furnished by one of the local merchants. Both wood and metal working machinery has been in better demand, as have also some classes of power transmission equipment. Several of the local machine tool merchants who have as a rule not catered to the second-hand class of business, are now giving this branch of the trade more attention, and are meeting, it is said, with fair success. The demand for second-hand boilers and engines does not improve rapidly, although dealers are hopeful of an enlarged demand as the spring advances.

There is practically no change in the demand for castings, either iron or steel. Foundries continue to operate on a restricted basis, in some cases not over three days a week being made. Some scattered improvement in the demand has been reported for certain classes of work, but the increased volume of business has not been maintained except in isolated cases. Forward business continues extremely light, as buyers cannot be induced to anticipate their wants. Some foundry men endeavor to maintain firm prices, as it is considered that no increased business can be had at price concessions. Others, however, will, it is said, make concessions to get business to keep plants in operation.

Plans will be drawn by Albert S. Damon, engineer, Darby, Pa., for the purification and disposal of sewage in the Cobbs Creek and Darby Creek valleys, which has been emptying into those streams, which are tributaries of the Delaware River. These plans will include septic tanks and filter beds, at an estimated cost of $150,000, provided the surface water is allowed to continue to drain into the streams.

The Pottstown Water Company, Pottstown, Pa., has decided to increase its capital stock from $225,000 to $400,000, in order to provide funds for the construction of a filter plant and to make other needed improvements to its water service.

J. J. Felin & Co., packers, are having plans prepared for a large addition to the plant at 4142-4156 Germantown avenue. The proposed building will be two and three stories in hight, 75 x 250 ft. The architect, P. A. Klee, will shortly take bids for the erection of the building, which is estimated to cost about $180,000.

Actual work has now been started, under the various contracts, on the work of removing the Ninth street grade crossings of the Philadelphia & Reading Railroad. Temporary tracks have been laid to take care of traffic, and there will be no interference to the work in connection with the elevation and depression of the tracks, which will now go steadily forward to completion in that district between Berks and Broad streets. Engineers are now engaged in completing plans for the other sections of the work which, it is expected, will be ready for bids in a short time.

The Board of County Commissioners at Washington, Pa., will receive bids until March 24 for the construction of three steel plate girder bridges, one of 50-ft. span, over Wheeling Creek; one of 56-ft. span, over Mingo Creek, and one of 56-ft. span, over Cross Creek. Also one 16-ft. span reinforced concrete bridge in North Franklin Township. Specifications may be had from the County Engineer at the above address.

Stockholders of the E. H. Mumford Company, manufacturer of molding machines, will meet at the office of the company in this city March 23, to consider a proposition of increasing the capital stock of the corporation from $30,000 to $200,000. Under the plan of increase there will be $65,000 of preferred stock and $135,000 of common stock.

There has been some little improvement at the League Island Navy Yard. Sixty additional men will be given employment, it is said, to overhaul the New Hampshire, which docked at the yard last week. The Mississippi, it is understood, will also be overhauled at this yard, and it will, it is expected, require a further additional number of mechanics.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 17, 1908.

Uncertainty still pervades the local machine tool producing interests, and although the feeling is perhaps a trifle more hopeful, one cannot truthfully say that conditions are improved. Inquiries there are, but sales are comparatively few and far between, consisting of a purchase here and there of a tool or two that is absolutely needed. Many plants are still running on limited time and with a handful of men, although there are, as has been stated in previous letters, a few running on full time and with approximately a full

force, but these are not the larger works. The recent specifications for small lots of tools for the Mare Island and Puget Sound navy yards interested and in a measure revived somewhat the flagging spirits of toolmakers, but actual developments give little license for gratification. As a prominent tool manufacturer says to *The Iron Age*, "It is simply a case of wait; we are hopeful, but there it ends."

A member of one of the largest tool manufacturers in this section has been exploring the Far West for several weeks, making an exhaustive investigation into agency conditions in a section of the country not hitherto visited personally by many manufacturers. His report to the other members of his company indicated that he found business very quiet there, and little if any better than the East and Central territory. He is returning by way of St. Paul, Minneapolis and other Northwest interior cities, and expects to reach home by Thursday or Friday of this week. His report is awaited with no little interest by the entire toolmaking district, for he has investigated very carefully and conservatively.

Considerable interest has been aroused by President Hargreave of the Cincinnati Machine Tool Company, Vice-President F. B. Wiborg of the Ault & Wiborg Company and other members of the Manufacturers' Club in the contemplated trip of manufacturers to South American countries in the interests of their products. There is no doubt that the journey will be made, and for the most part the party will be made of officials from the large plants. This, however, is a matter for the fall or early winter months because of climatic conditions.

In the matter of the Weber Foundry sale, the property has been placed in the hands of a local firm of auctioneers and April 15 has been set for its disposal.

A careful inquiry into foundry conditions shows that there are few Cincinnati foundries running more than two heats per week, and the melt is conservatively not more than from 20 to 25 per cent. of the normal. Manufacturers using castings apparently are not inclined to contract for anything in forward deliveries even under price concessions, which some foundries, it is said, are inclined to grant to keep working forces engaged.

The Troy Foundry & Machine Company, Troy, Ohio, has been adjudged bankrupt.

A recent transaction involving the purchase of additional ground and improved property by the Cincinnati Iron Store Company has given a little local stimulus to the iron and steel trade. This company, of which E. H. Busch is president; James I. Stephenson, vice-president; James A. Sebastiani, secretary and treasurer, has purchased the realty known for many years as the Scott Pottery Works, which is located at Front and Carr streets, adjoining its present property. There are about 55,000 sq. ft. of ground in the piece and four or five buildings in comparatively good repair. Within the next 30 or 60 days the organization will have been completed under the new name, the Cincinnati Iron & Steel Company, the charter for which was acquired last July, with a nominal capital of $10,000. The company now owns practically the entire block bounded by Front, Carr, Freeman avenue and Sargent streets, with a ground space of about 140,000 sq. ft. Under the outlined plans of expansion the company will carry a large line of machine tools and special machinery, utilizing the buildings on the property, which are now being reroofed and put into shape for use. There will be no change in the management. The amount involved in the purchase was about $75,000.

The F. H. Lawson Company, manufacturer of and dealer in tinware, copper, sheet iron, stamped and japanned ware, specialties, &c., has purchased the stock and part of the machinery of the Queen City Tinware Mfg. Company on lower Walnut street, involving between $40,000 and $50,000. The latter company retires from the trade. The F. H. Lawson Company states that there will be no immediate changes made in its large plant on Whately and Evans streets and Cincinnati, Hamilton & Dayton Railroad, but that some additions and improvements may eventually be made.

Manufacturers of machinery and machine specialties are interested in the outlined projects of the Merchants' and Manufacturers' Association of Cincinnati, which contemplates a large buyers' excursion into local trade marts in the early fall. Some special forms of entertainment are being devised, and committees will be appointed to take charge of the various diversions arranged for buyers' pleasure and profit. The suggested dates are August 26, September 2 and 9.

The removal of the San Francisco branch of the Sterling Emery Wheel Mfg. Company, Tiffin, Ohio, is announced. The far Western headquarters of this company is now located at 461 Market street, in the Sheldon Building, rooms 305 to 316 inclusive. The notice is signed by Harron, Rickard & McCone, San Francisco.

Operations have been resumed at the new plant of the Ohio Steel Castings Company, Lima, Ohio, which was shut down for a brief period.

At the plant of the Lima Locomotive Works in Lima some special orders are on hand and a slight improvement is noted in the demand for the patent Shay locomotive. A 150-ton Shay locomotive has been shipped to the Chesapeake & Ohio Railroad, and the Pennsylvania Railroad has placed order for a 250-ton Shay locomotive, which will be the largest, it is stated, ever built at that plant.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., builder of automatic engines and dynamo and electric machinery, has opened a district sales office at 907 Andrews Building, Cincinnati, Ohio, under the management of George W. Euker, who has had a varied experience in electrical and power plant work.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 17, 1908.

Local dealers report a slight improvement in their sales of machine tools during the past week and considerable improvement in inquiries. While the market is quiet when compared with normal conditions, the increased number of inquiries leads dealers to feel considerably encouraged and to look for a fair increase in the volume of their sales as general conditions gradually grow better. The character of the buying has not changed materially, the orders being largely for single tools, mostly lathes, planers, shapers and milling machines. A few larger orders, however, are now appearing, one dealer reporting having received during the week two orders, each for four tools.

None of the new inquiries is large, but there are several from large industrial plants that have under consideration the matter of throwing out some of their old and out of date equipment and replacing it with more modern tools. There are several inquiries of this nature for three or four tools. Some of the buying during the week has been by new repair shops and by small companies organized some time ago, but which have delayed going ahead with their projects because of the financial and industrial conditions. Traveling salesmen representing local machine tool dealers report that conditions show some improvement in the territories which they visit and they are getting more requests for quotations on tools. Among the inquiries received by a local dealer is one from a Pittsburgh concern for several large tools, including a boring mill, two milling machines, lathe, shaper and gear cutter. The company has not definitely decided whether it will buy at the present time. Quite a number of small tools will be required for the new Technical High School in Cleveland, the list of which will soon be out.

The demand for second-hand tools is fairly good and the supply is becoming somewhat more plentiful.

While inquiries are somewhat better with tool builders the majority report that orders have not increased in volume, the prospective purchasers being very slow about placing orders. While general conditions appear brighter, few machinery and other industrial plants have had enough of an increase in orders to warrant the operation of their plants on a larger capacity than they have been running on during the past few weeks. Projects now on foot indicate a fair demand for equipment for small electric lighting plants. The demand for cranes shows a little improvement, the inquiries being mostly for small single cranes. Local structural shops report considerable improvement in small orders, particularly for fire escapes, the recent disaster in the burning of the Collinwood school having aroused the authorities in many places to provide adequate fire escapes for schools and other public buildings. Structural work is being taken at low prices.

Machinery Requirements of Technical High School.

The list of machine tools that will be required for the new Technical High School, Cleveland, has been partially prepared and will be given out by the Board of Education through Principal Barker within the next two weeks. The list as now planned, although some slight changes may be made, includes 18 14-in. lathes, one 24-in. lathe, boring mill, surface grinder and tool grinder. Some tools now in use in another school will be transferred to complete the machine shop equipment. Complete equipment will be purchased for the turning room and pattern shop. This will include 60 10-in. woodworking lathes, five band saws, surfacer, jointer, saw bench, &c. Specifications have been prepared for the generators and engines for lighting, power, ventilating and elevator in the new building. There will be two single cylinder medium grade steam engines, for direct connection with the generators. There will be two direct current three-wire generators, one 200 kw. and the other 125 kw. The specifications also include one 20 to 22 hp. fan motor and one 28 to 30 hp. fan motor. In addition several motors will be required for the machine and other shops, specifications for these not yet having been prepared.

The Clough-Baird Mfg. Company, Cleveland, manufacturer of stove trimmings, &c., has increased its capital stock from $7500 to $60,000, for the purpose of building a new plant, on which work will be started soon. The capacity will be much larger than that of the present plant. An order has been placed for a 200-hp. gas engine, and the company will be in the market for very little other equipment for its new plant.

The company reports business quite satisfactory at present, orders having improved materially during the past two or three weeks.

The Fuel & Gas Improvement Company, Cleveland, has been incorporated, with a capital stock of $1,000,000, to place on the market a new gas producer. Permanent officers have not yet been chosen. The company has opened offices at 613 Schofield Building, and it is equipping a room in a factory for demonstration purposes. The company will assemble the parts, but will have its manufacturing done by other concerns.

The National Iron & Wire Company reports considerable improvement in the demand for structural work. In addition to the contract for the structural steel work for the West Side market house, requiring about 800 tons, this company has just secured the contract for the structural work for two buildings for Cleveland, one in Warrensville, taking 100 tons, and for a new plant to be erected by the American Brass Mfg. Company, Cleveland, requiring 100 tons. The company has also in the past two weeks received a number of orders for fire escapes.

The Parr Regrinding Globe Valve Company, recently incorporated with a capital stock of $10,000, has purchased the greater part of the machine tool equipment for its plant, which will be placed in operation in a few days. The company has opened temporary offices at 600 Broadway.

W. H. Welch, dealer in metal working machinery, has removed from 723 Williamson Building to 202-204 St. Clair Avenue, N. E., where he has opened a machine tool storeroom. The room will be the headquarters for northern Ohio of the Hamilton Machine Tool Company, Hamilton, Ohio. Mr. Welch being that company's representative in this territory. A complete line of the Hamilton Company's tools will be carried in stock.

The city of Cleveland will probably soon be in the market for a new engine and generator for the municipal lighting plant at South Brooklyn. The City Council has taken steps to appropriate $35,000 for that purpose.

With a capital stock of $20,000, the Warren Construction Company, Warren, Ohio, has been incorporated by Elmer A. Osborne, C. E. Osborne, Edward Tanneyhill, W. H. Tanneyhill and Mrs. Maude Gilmer. The company will do a general contracting business in iron and steel work.

The Bolivar Electric Company, Bolivar, Ohio, has been formed by Canton men, with a capitalization of $30,000, to build an electric lighting plant in Bolivar. It will be operated by water power. The officers are L. P. Conrad, president; A. H. Elliott, secretary, and R. P. Lambright, treasurer.

The Square Deal Mfg. Company, Delaware, Ohio, recently organized to manufacture hay presses, has elected the following officers: H. F. Owen, president and general manager; Joseph J. Neville, vice-president; L. Trabue, superintendent, and A. S. Conklin, secretary and treasurer.

The recently incorporated Radio Furnace Company, in which a number of Youngstown men are interested, has decided to locate its plant in Warren, Ohio, and has purchased the property formerly owned by the Warren Pottery Company, which will be fitted up for a plant. The company will manufacture hot air furnaces. M. J. Murdock is president.

The Akron Clutch Company, Akron, Ohio, including the machinery, patents and good will, has been purchased by the Williams Foundry & Machine Company, Akron, and the plant will be moved to the plant of the latter company, where the business will be continued under the name of the Akron Clutch Company.

New England Machinery Market.

WORCESTER, MASS., March 17, 1908.

The machine tool dealers are booking a few orders, and some of the builders report that there is a slight improvement, though not sufficient to denote any permanency. The usual number of inquiries continues. They have been so long in evidence, the total amount of business which their realization in orders would mean is so great, that they constitute a most tantalizing factor in the situation. There is marked difference in the reports of machinery men. The experience of some has been more encouraging than that of others. But none is doing a large business. In fact, the belief is gaining ground that it will be autumn before a really important improvement will be noted. But utter certainty is expressed that when the change comes it will be to times of greatest prosperity, even, perhaps, exceeding that which recently passed.

"Hustling" is a good word to apply to the efforts of many manufacturers. Their forces are straining every energy to get what business there is doing, and at the same time putting in a vast amount of missionary work, which will count as soon as the market revives in a pronounced degree. An instance of the seeking of new business is that of a gray iron foundry man in one of the towns of Massachusetts some distance from Boston, who went to that city on the first morning train, secured the services of a district messenger boy as pilot and visited 22 customers during the day. He secured two good orders, which meant enough business to increase the working hours of his foundry. It was not easy for a manufacturer or dealer to get down to such strenuous effort when business first fell off; there had been so different a condition that the sudden change was not easy to get used to. But now every one is down to the new basis, and competition is most keen. Because of this it is all the more satisfactory to see how well prices are being maintained. There is yet to be recorded a complaint of one of the Boston dealers against another.

Collections are improving, according to the best sources of information. They are not yet good, but there is less of delay from those customers who are ordinarily quick pay but who were compelled to abandon temporarily their practice of taking advantage of all discounts, or where no discount was obtainable of meeting religiously all bills on the appointed day. The banks are no longer stinting customers who need money for legitimate purposes, there having been a marked change in this respect during the past month or six weeks.

New manufacturing enterprises are going along with the fulfilment of plans, and there will be considerable building activity among them as well as among established concerns, considering the state of business. There is a natural feeling that this is a first rate time to start business and to prepare for the time when the market will be greedy for all kinds of manufactured products.

For this same reason some notable new machine tools are being brought out, and will be given to the public soon. Some of them will be of special interest, because of almost epoch making improvements on established designs. This is true of the machinery centers of other parts of the country as well as New England.

The Universal Machine Screw Company, Hartford, Conn., is to erect new shops in that city. The capital stock has been increased from $100,000 to $250,000 to provide funds for the new plant, and to otherwise increase facilities to take care of increasing business. The company builds a multi-spindle screw machine. It began business about two years ago, in a part of the factory building, the whole of which it now occupies, and which it has already outgrown.

The C. G. Garrigus Machine Company, Bristol, Conn., which will manufacture special machinery in that place, has been incorporated under Connecticut laws with capital stock of $50,000. The incorporators are Clarence G. Garrigus and William L. Barrett, Bristol, and Louis G. Judd, New Britain, Conn. Work on the new shop building, already alluded to in this column, will begin in the near future.

The interesting, though unverified, rumor comes from Hartford, Conn., that the Packard Motor Car Company is to take the plant of the Electric Vehicle Company, in that city, removing its works from Detroit.

The Gardner General Foundry Company, Gardner, Mass., manufacturer of gray iron, brass and composition castings, has made material improvements to its foundry, including an addition for a machine shop, and various important changes in the main building. The company has increased its running time from four to five days a week.

The Seamless Rubber Company, New Haven, Conn., manufacturer of rubber goods, has added $100,000 of new stock to its capital, all of which was paid in cash. The purpose of the new money is not to increase the plant, but to provide additional working capital.

The Connecticut industrial stocks, quoted on 'change at Hartford, are remaining firm, with a slight improvement in price, if any change at all is to be noted. These stocks, including the larger concerns in the metal lines, constitute an excellent barometer of business. During the last six months there has been a decided falling off in stock values, and the slight reaction of improvement would seem to have some significance.

The Heald Machine Company, Worcester, Mass., has brought out a new internal grinder for general manufacturing work, which includes a number of interesting new features for this class of work.

A dispatch from Waterbury, Conn., states that the Waterbury Mfg. Company of that city, manufacturer of brass goods, has had plans prepared for a new group of manufacturing buildings, but that no definite decision has been reached as to what will be done this season in their erection.

The Blake & Johnson Company, Waterbury, Conn., has decided not to proceed with the erection of its new shop buildings this season, as the present plant will answer its purposes until next year.

Government Purchases.

WASHINGTON, D. C., March 17, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 31 for 18 motors, one boring bar, one turbine blower and one portable grinder for the Eastern navy yards. Bids will be received until April 14 for a 10-hp. motor, and until April 21 for

two turret lathes and one lathe for the Mare Island Navy Yard.

The Isthmian Canal Commission will soon ask bids for one horizontal duplex steam pump and other supplies.

Bids will be received until April 7, at the office of the Lighthouse Engineer, Tompkinsville, S. I., for a boiler.

The following bids were opened March 10 for supplies for the navy yards:

Class 51. Two 10-ton three-motor electric traveling cranes—Bidder 9, Alliance Machine Company, Alliance, Ohio, $10,980; 43, Cleveland Crane & Car Company, Wickliffe, Ohio, $7040; 56, Case Mfg. Company, Columbus, Ohio, $11,440; 138, Morgan Engineering Company, Alliance, Ohio, $9390; 149, Manning, Maxwell & Moore, New York, $9930; 156, Niles-Bement-Pond Company, New York, $7828 and $8340; 158, Northern Engineering Works, Detroit, Mich., $9400; 176, Pawling & Harnischfeger, Wilwaukee, Wis., $11,300.

Class 61. One 20-ton steam locomotive crane—Bidder 6, American Hoist & Derrick Company, St. Paul, Minn., $8648; 29, Browning Engineering Company, Cleveland, Ohio, $7519, $8644 and $9582; 33, Brown Hoisting Machinery Company, New York, $11,490; 43, Cleveland Crane & Car Company, Wickliffe, Ohio, $7147; 112, Industrial Works, Bay City, Mich., $10,425; 254, Interstate Engineering Company, Bedford, Ohio, $9999.50; 266, McMyler Mfg. Company, Cleveland, Ohio, $7500.

Class 62. One universal milling machine—Bidder 100, Henshaw-Bulkley & Co., San Francisco, Cal., $1905; 125, Karney & Precker Company, Milwaukee, Wis., $1895; 156, Niles-Bement-Pond Company, New York, $2373; 179, Pacific Tool & Supply Company, San Francisco, Cal., $2368; 253, Harron, Rickard & McCone, San Francisco, Cal., $2030, $2135, $1995 and $2034.

Class 152. One pump—Bidder 55, W. W. Clark & Son, Baltimore, Md., $169.90; 98, R. W. Geldart, New York, $171.47; 127, Knox & Bro., New York, $169; 149, Manning, Maxwell & Moore, New York, $172; 191, J. B. Roach, Brooklyn, N. Y., $171.10; 193, H. A. Rogers Company, New York, $160; 225, Vermilye & Power, New York, $170.

Class 171. One single acting triplex gasoline engine driven pump—Bidder 85, Fairbanks Company, New York, $1000; 92, G. & W. Mfg. Company, New York, $924; 147, Model Gas Engine Works, New York, $1267; 169, National Electrical Supply Company, Washington, D. C., $1171.39; 171, Ole K. Olsen, New Orleans, La., $947; 181, Peerless Motor Company, New York, $1170; 189, Rumsey & Co., Seneca Falls, New York, $995.75 and $1203.25; 241, R. B. Carter Company, New York, $961, $991, $885 and $920; 269, Otto Gas Engine Works, Philadelphia, Pa., $930 and $945; 274, Fairbanks, Morse & Co., New York, $954.65.

Class 191. One duplex pump—Bidder 15, Blake & Knowles Steam Pump Works, New York, $1100; 71, M. T. Davidson, Brooklyn, N. Y., $390.

The following bids were opened March 10 by the Department of Justice, Washington, D. C., for boilers, pipe, &c., for the United States Penitentiary at Atlanta, Ga.:

Oil City Boiler Works, New York, $16,700; Babcock & Wilcox Company, New York, $14,000; Heine Safety Boiler Company, New York, specifications submitted but no price quoted; Peter-Eichler Heating Company, St. Louis, Mo., $13,737; Abendroth & Root Mfg. Company, Newburg, N. Y., $11,145; Urbaner-Atwood Heating Company, St. Louis, Mo., $13,450; J. B. Hughes Heating Company, St. Louis, Mo., $13,400; Standard Engineering Company, Philadelphia, Pa., for Heine boiler $12,807.50, for Babcock & Wilcox boiler $13,840.

The following awards have been made for supplies for the navy yards, bids for which were opened January 28:

I. H. Johnson, Jr., Company, Philadelphia, Pa., class 1, one lathe, $7096.

Harron, Rickard & McCone, San Francisco, Cal., class 2, two lathes, $3350.

Newton Machine Tool Works, Philadelphia, Pa., class 3, one slotter, $2490.

Under bids opened February 10, Circular No. 416, for supplies for the Isthmian Canal Commission, the American Tool Works Company, Cincinnati, Ohio, has been awarded class 4, one screw cutting lathe and one lathe chuck, $593.

The following awards have been made for supplies for the Isthmian Canal Commission, under opening of March 2, circular No. 423:

Fairbanks, Morse & Co., New York, class 2, four boiler feed pumps, $620.

H. R. Worthington, New York, class 3, six horizontal boiler pumps, $212.

Long & Alstatter Company, Hamilton, Ohio, class 4, one punching and shearing machine, $845.

The following awards have been made for supplies for the navy yards, bids for which were opened March 3:

Henshaw, Bulkley & Co., San Francisco, Cal., class 11, one power press, $1088.

Frevert Machinery Company, New York, class 12, one power circle shear, $60; class 13, one dry floor grinder, $156.

Class 22, one motor driven concrete mixing machine, has been canceled.

Trade Publications.

Swedish Iron and Steel.—Swedish Iron & Steel Corporation, 16 Exchange place, New York City, and L. & L. & G. Building, New Orleans, La. Catalogue. Covers the company's imports of Swedish tool steel, anvils, chains, &c. Rekord Superior is a high speed steel offered. Instructions are given for its working and treatment in the making of various kinds of tools, and a list of shapes and sizes carried in stock. The brand labels for cast steels handled are reproduced in colors, and their uses and carbon contents are given. They include Superior Swedish cast steel and several kinds of Dannemora cast steel, hard and soft. Information concerning each class is given as to its utility, characteristics, treatment, &c., with tables of prices, dimensions and weights. Swedish solid steel anvils and Swedish steel chain are also referred to and lists given of stock sizes.

Water Tube Boilers.—Oswego Boiler & Engine Company, Oswego, N. Y. Bulletin No. 12. Illustrates and describes the Oswego-McNaull water tube boilers, which are regularly built in standard units of from 50 to 500 hp. The boilers are claimed to be designed on correct principles with straight tubes, longitudinal drums and steel headers, and to meet the requirements for a safe, durable and economical boiler.

Brace Railroad Rails.—Thomas Brace Rail Company, Temple Bar, Brooklyn, N. Y. Catalogue. Contains an article entitled "Railroad Rails, Their Defects, How to Improve and Reduce the Cost," by E. T. Thomas, with special reference to the "Thomas" brace railroad rail, of which specifications and line drawings are given.

Turret Lathes.—Niles-Bement-Pond Company, 111 Broadway, New York City. Catalogue. Size 6 x 9 in.; pages 43. Illustrates and describes the Pond rigid turret lathe, which is designed for producing work ordinarily done on engine lathes, and is especially adapted to such work as gear blanks, flywheels and gas engine cylinders, and for heavy work such as wrist pins and projectiles. The lathes are regularly built in 21 and 28 in. sizes.

Feed Water Heaters.—Harrison Safety Boiler Works, Columbia Station, Philadelphia, Pa. Circular entitled "May We Inquire?" Discusses how to obtain more hot water from a boiler feed water heater where the quantity of exhaust is limited. It shows that open heaters have the advantage over closed heaters in this respect, also in that they save the condensed exhaust, provide for purifying the water and liberating air and carbonic acid gas, that they serve as an independent oil separator, expansion and return tank, pump governor, hot well, &c. The Cochrane heater is an example of the open type, and is further claimed to be more easily cleaned than a closed heater, this point being illustrated by photographs.

Riveters.—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Circular and blotter. These pertain to Hanna pneumatic and hydraulic riveters, which are built in any style, size or pressure, and which may be operated in any position to suit conditions.

Sheet Metal and Paper Machinery.—Charles Leffler & Co., 61 Clymer street, Brooklyn, N. Y. Loose leaf catalogue. Size 6 x 8¾ in. The pages at present in force give illustration and specifications of foot power pendulum presses, notching machines, lever and toggle lever presses, adjustable power presses with and without automatic feeding devices, power horning presses, stationery and inclined arch power presses, reducing presses, double crank power presses, power punching presses, double action adjustable power press, slitting machines with and without automatic feeds, foot power cam body formers, cam body flanging machines, double seaming machines, round double seamers, square double seamers, seam rolling machines, trimming and beading lathes, double head crimping machines, threading machine with automatic pressure, crimping and beading machines, soldering frames and cylinders, power squeezers, drop presses, and an automatic machine for folding circulars, and one for pasting labels on bottles.

Economizers.—Green Fuel Economizer Company, Matteawan, N. Y. Catalogue. Size 6 x 9 in.; pages 160. Takes up not only the history and merits of the Green fuel economizer, but also such engineering topics as the absorption of heat by different parts of the boiler surface; the relative economy of boiler surface and economizer surface under various conditions; methods of determining the economy of additional heating surface from the load curve; the effects of oil fuel, high steam pressures and superheat on boiler economy; methods of measuring the temperature of flue gases, and reports of various tests of boiler plants containing economizers.

Engines and Batteries.—Westinghouse Machine Company, East Pittsburgh, Pa. Nine catalogues. These give illustrated descriptions of Westinghouse single acting compound engines, standard engines, Westinghouse-Parsons steam turbines, Westinghouse storage batteries, storage batteries for gas engine ignition and storage batteries for stationary use. Three catalogues of instructions and suggestions refer respectively to Westinghouse compound automatic engines, Westinghouse-Parsons steam turbines, and Westinghouse gas engines.

Corliss Engines.—Vilter Mfg. Company, Milwaukee, Wis. Catalogue E. Size, 6¾ x 10 in.; pages, 65. Presents a number of illustrations of the company's Corliss engines, showing the general design and construction, for which the special claims of efficiency, durability and simplicity are made. The parts of the engines are described and illustrated, and some views of the company's plant are given. Tables of capacities and dimensions and partial lists of users are included.

Pipe Cutting and Threading Machinery.—Bignall & Keeler Mfg. Company, Edwardsville, Ill. Catalogue No. 17. Size, 6 x 9 in.; pages, 54; cloth binding. Covers the company's complete line of products, including Peerless, P. D. Q. C. and Duplex improved pipe threading and cutting-off machines, emery surfacers, die stocks and rolling cutters. Brief descriptions accompany each of the illustrations of the different sizes of the various machines and their more important parts. Information bearing on pipe and pipe threading is appended.

HARDWARE

MERCHANTS of certain agricultural sections who depend upon the farmers for a large amount of their custom report that the Pure Food law is working to their advantage in an important way. Vermont affords a striking illustration of this in the maple sugar and butter industries. At the present time the Hardware merchants are enjoying a brisk trade in the tools and appurtenances of maple sugar gathering and manufacturing. The Pure Food law struck deep into the root of the industry as it has existed, compelling a stop to the very general adulteration of the product of the maple sap. The result is a large increase in the demand for the pure sugar, and the consequent increase in prices has impelled owners of sugar maple groves to make the most of the harvest until an important demand for equipment has resulted. Higher prices for pure butter have worked out in a similar manner. The farmers of the section are thus reaping a richer reward for their labor and investment. These are only instances of the workings of the new law; similar changes in conditions must prevail in other sections of the country, and in a widely diversified list of agricultural products.

So radical an industrial outcome of a new law suggests a field of business activity for the merchant in seeking out every opportunity for his patrons to benefit by any change in the existing order of things. Many farmers are not progressive. They are not in as close touch as are well informed merchants with what is going on in the commercial and industrial world. They are slow to take advantage of the conditions of their market beyond the immediate present. They are not equipped to plan for the next season. Their sources of information are apt to be meager, and they are unable to look into the future and see where they can best direct their efforts to secure the greatest possible remuneration from their toil and their acres. The intelligent merchant can assist them greatly, and in their success lies the profits of his business. If some one crop of his section promises to bring high prices, because of some known influence on the market, such as the Pure Food law, a campaign of education should bring results. In many communities the farmer is dependent for much of his news of the outside world upon his visits to the stores of the town where he does his trading. It is for Hardware merchants of intelligence to make it their business to be informed and alert in regard to matters in which their customers, and especially their farming customers, are pecuniarly interested. The Hardware store should be the center of information in town, and directly or indirectly the merchant occupying such a position and disseminating useful information would be sure to reap substantial advantage.

Curious and unexpected results often follow from interference with the natural course of trade. A manufacturer's selling goods direct to consumers seems far removed from efforts by merchants to induce him to market his products through the branch of trade to which the merchants in question belong. The direct dealing with the consumers, the merchants being ignored in the premises, is, however, a consequence of the efforts made by the merchants in this line to have the manufacturers refuse to sell goods to any branch of the trade. The facts are that jewelers objected strenuously to the sale of Silverware to Hardware merchants, and did this so emphatically that one prominent manufacturer at least, not deeming it expedient to accede to their request—using a mild word to express a graceless and imperative demand—has reached the conclusion that it will be advisable for him to go direct to the public, cutting out altogether the merchants, wholesale and retail. The attempt to confine trade too closely in a certain channel seems in this case to result in breaking down such barriers as existed, and thus instead of restricting the sale as desired had a directly opposite result. Dictation in such matters is naturally resented and generally fails to accomplish its purpose.

Condition of Trade.

Without any important development in the market a gradual improvement in the general situation is apparent. If there were simply no change for the worse this would be in fact a progress toward recovery and a better state of things. It would indicate that there is little danger of a relapse, and that the commercial and manufacturing situation is sufficiently sound to hold its own and withstand influences which might tend to give it a setback. There are, however, evidences of improvement in business generally. There is less financial stringency, money, in fact, becoming abundant. There is also at the same time a considerable larger volume of current business when the market as a whole is regarded. While the railroads feel seriously the falling off in the amount of merchandise carried and have many idle cars, impressing upon them the necessity of reducing operating expenses, there is with the advance of the season more for them to do, and reports are not altogether discouraging. With a good though diminished volume of exports, there is every prospect that the country will have a noble balance of trade to its credit, and this should be an important influence in securing its financial security and ease. In connection with farm products, we are assured that there is a large amount of grain still in the farmers hands, which will find its way before long into market and thus keep up the prosperity of those who are fortunate enough to own it. At this early date, too, it is well to note that the indications, whatever they may be worth, in regard to the crops are good, the winter having been generally favorable. We dwell on these general features because Hardware and its related lines can only be expected to keep step with the movement of trade in other branches. In the Hardware field the market in different sections and in different lines of goods presents many unevennesses. The reports from jobbing houses are on the whole gratifying in regard to the volume of business they are doing and the general healthfulness of the trade in their territory. Some manufacturers find the demand comparing pretty well with other years at this season, but in some lines there is a good deal of complaint. The disposition on the part of merchants, wholesale and retail, is to defer buying unless goods are actually required, and in such cases to place orders very conservatively and for small quantities. Prices in many leading lines are well sustained, and manufacturers generally are to be given credit for much self-control in refusing to lower their quotations in the attempt to secure orders. In some lines, however, there is a notable weakness and irregularity, and in some goods,

of which Axes and Agricultural Wrenches are an example, the market seems to have given way. The strength of raw material and such lines as Wire and Wire Nails, owing to the steadying influence of the leading interest, does much apparently to keep things from going to pieces. With the advance of the season and the coming of settled weather an increase in the volume of business is looked for.

Chicago.

Already the anticipated effects of continued spring-like weather are being felt in a perceptible quickening of trade movements in Hardware lines. The increased interest of dealers is being expressed in more frequent requests for shipments of contract orders and new orders are coming out a little more freely, especially from buyers who have delayed purchase of seasonable goods beyond the usual time. Poultry Netting is thus more in demand and under the same stimulus Wire Cloth orders are more numerous, although neither are moving in normal volume. The general conditions underlying market activities have undergone no positive change, and an undertone of hesitation, due to an apprehension of shrinkage of prices, is still strongly in evidence. The prevalent attitude of buyers in this respect is strengthened by current comment in the daily press and elsewhere predicting a widespread revision of prices on Iron and Steel material, which would of necessity effect values of the more highly finished products. Whatever may be said of the potency of this feeling in restricting buying for forward requirements, it can hardly be regarded as having an important bearing on purchases for immediate consumption, which constitute the bulk of the business. At the same time it is generally recognized that a greater degree of certainty as to the ultimate course of prices would contribute materially to a clearing of the situation. Meanwhile most of the standard staples continue to show a satisfactory degree of firmness. Sheets, both Black and Galvanized, are rather in advance of other mill products in steadiness of prices and strength of demand. Wire Nails maintain their position reasonably well, and considerable improvement in new business is looked for very soon if the promises of an early spring are realized. In the Heavy Hardware trade only a moderate demand for Steel and Iron Bars is reported, but some fair sized orders for Tire sizes have been coming in of late, which would signify more activity in the wagon and carriage shops. After months of delay the La Salle Hotel project, which involves the construction of a building costing approximately $2,500,000, seems to be taking definite form and bids fair to swell the year's volume of local trade in Builders' Hardware by a considerable sum. In general, however, the outlook for business in this line is more favorable for the ordinary grades required in flats and dwellings of moderate size than for the higher grades used in large public structures.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Conditions in the Portland territory, as near as the writer can find out, continue to be remarkably good compared to the rest of the country. The writer has just returned from a visit to California, and a short time before was in the Puget Sound territory. Owing to local conditions, we find that in these territories business is not as good as it is in Portland. All along the Pacific Coast merchants are looking for a gradual revival of business during the year, especially after the political uncertainty is terminated by the Presidential election.

One feature is the same up and down the Coast—country business is uniformly better than city business in proportion to preceding years. While business as a whole is not an improvement over last year, there is practically no decrease in the Portland territory. Outside territories do not give as good a report of themselves. This is due to a variety of causes, but very largely to the fact that dealers are buying from hand to mouth, and therefore buy as close to home as possible. From all we can learn, the Middle West and Eastern jobbers are showing comparatively a much larger decrease in Coast territory business than local jobbers. One favorable indication which we might mention of our business conditions is the fact that houses here are receiving very few applications for positions, except from people who have recently come from the East, and even these are not as numerous in Portland as in other parts of the Coast.

As this letter is being written the last spike is being driven on the North Bank road, which will give Portland in effect two more transcontinental lines, and will divert a large portion of the traffic going to Puget Sound down the water grade of the Columbia into Portland. This promises a great increase of business to Portland merchants.

Swift & Co., according to the daily papers (and we believe in this case the papers have the facts), are about to commence construction of a $3,500,000 plant just outside the boundaries of the city of Portland, and if they can obtain the right site Swarzchild & Sulzberger are about to invest $1,500,000 in another packing plant, also in Portland. They already have option on a portion of the necessary property. These two plants mean a great deal, not only to Portland itself in the way of pay rolls and rentals, but a great deal more directly to the territory tributary to Portland, affording them a large competitive market for their cattle.

It has been rumored in the papers that the Hill line, on completion of the North Bank road, will establish their own steamship line running out of Portland to San Francisco in competition with the Harriman lines and the independents now on the run. It is also rumored, but with how much foundation it is impossible to say, that these lines may cover an even greater distance. This undoubtedly will bring much business to Portland which it has not heretofore enjoyed.

From all the writer can learn from the papers and from conversation with people who have returned recently from the East, and from his observation on his trip to the South, the Pacific Coast is probably in better shape financially than any other section of the country, and that on the Coast Portland territory to-day is probably in the best condition.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Since the first of the month we have had very pleasant weather. There is danger that the conditions of last year will be repeated—a very warm March, with freezing weather in April. Last year this caused great damage to the fruit crop. It resulted in a late spring, making it necessary to plant a number of crops several times.

We offer up our prayers for winter in the wintertime and summer in the summertime. If it were possible to legislate on the weather we would appeal to our State Legislature. We would call for a commission to be appointed to investigate the weather and make a report.

Again we have been treated to the annual Axe vaudeville. If the entertainment were not so expensive it would be more amusing. On account of the financial disturbances the latter part of last year practically all jobbers and retailers have carried over good stocks of Axes. Therefore there was no call either from the jobbing or retail trade for a reduction in the price of Axes. It seems, however, it is not possible for all the Axe manufacturers in this country to remain on the map at the same time. Somebody is destined to "get off the earth."

Each of the leading Axe manufacturers accuses the other of being the cause of the fracas. We have heard stories of one manufacturer traveling, followed by several detectives, who send daily reports to other manufacturers. Surely this is competition down to date.

Following the tradition of most fights, the innocent bystander gets hurt. The manufacturers fight—jobbers and retailers with stocks of goods on hand suffer the consequences.

The original plan outlined was that prices on manufacturers' brands should be maintained. New fighting Axes have been brought out for this season's carnage. It seems, however, even the prices on manufacturers' brands will not be maintained. Both manufacturers' brands and jobbers' special brands will be lower. Spe-

cial cheap Axes for fighting purposes will be put on the market. The writer suggested to one manufacturer he name his fighting Axe "The Idiot Child," and he is still considering the suggestion.

Laying joking aside, it seems to us—and we believe to all the other large distributers of Axes—it is a shame that this important line of goods should be subject to such conditions.

Cross Cut Saws are in many sections gradually usurping the place of Axes. There is less waste with a Cross Cut Saw. There are a number of manufacturers of Saws. They advertise, they "talk fierce," but we have never yet heard one of them accused of cutting the prices on his goods. In fact, when we balance a first-grade Cross Cut Saw in our hands, when we figure up the amount of steel and amount of labor, we take off our hats to the sales department of the manufacturers.

The trouble with Axes is in the fact they are very easily made. Notwithstanding the protests we are sure to hear from some of our Axe manufacturing friends, we do not believe it takes any remarkable skill to produce a satisfactory Axe. That is the main cause of the trouble. When an Axe factory is once organized they can produce Axes *ad infinitum*. In other lines, probably in the making of Saws, it takes more skill. Skilled workmen are educated slowly. Therefore this one condition, in a measure, checks the production of Saws.

We sometimes wonder just what it does cost to produce an Axe. When we consider the price of "The Idiot Child," and then compare it with one of the same manufacturer's own brands, we are led to conclude that either he must be losing money on his "Idiot Child," or that he is making an euormous profit on "The Pride of the Family."

Are there manufacturers in other lines preparing to star the country in similar vaudeville stunts? If so, please don't. Most of us have not quite recovered from the vaudeville on Wall Street last November.

Jes so! Jes so!

Cleveland.

THE W. BINGHAM COMPANY.—Since writing our last letter we are pleased to note there has been quite an improvement in business. Orders are coming in more freely, both by mail and from our salesmen, especially for season goods. The low stocks carried by the retailers throughout the country have caused many of them to order often and in small quantities, but for the past week orders have been coming in more freely and fairly well assorted, also in larger volume, and the outlook is more encouraging from day to day.

With warmer weather and the natural opening up of the spring trade there should be still further improvement. Many of our manufacturers who have been running on short time are increasing their hours and also the number of men employed, and while we may not receive the amount of business in the year 1908 that we did in 1906 and 1907, we have every confidence to believe we will have good business from now on. Our collections are fairly good, and the outlook is much more reassuring.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Springtime has come sure enough, according to the thermometer, barometer, hydrometer and all the other "meters" in the calendar. We are enjoying (?) our third flood this year—not so high as a well turned upside down, but evidently wider than any barn door we know of, and it certainly suffices for all the needed aqueous demonstrations of these prevailing prohibition times. The ground is getting a good soaking, and no doubt springs will be running uninterruptedly all summer long. Sunshine has come, and with it the hope which springs eternal in the human breast.

Business is climbing upward slowly and laboriously. The orders are a little larger, a little more frequent, and the comparison between now and a year ago is not quite so trying as in November and December. There has been very little actual distress so far as we can measure it. Social settlements and the rival Salvation armies have made the most of what there was. Much of the trouble has been in the apprehension of what would happen if things grew worse. All sorts of prescriptions are being doled out by the various legislatures. It is the patient who has been subjected to the shaking rather than the 8 or 10 oz. phial.

The railroads are complaining of short tonnage. The writer has recently taken a trip through the South, and found the cars full of travelers wherever he went, and the terminal yards and main tracks better cleared of trash. There did not seem to be a stray spike or any odd nuts and washers strewn around as usual along the line. Every scrap has been picked up which would stand for money or if left would indicate waste. I was told that instead of putting in new ties, which in many instances should have been done last year, the section hands were simply reversing them and turning the old ties bottom up in the hope that the bottom was in better condition than the top. Just how far this can be done economically we cannot tell. It would seem as though the railroads might follow a policy of:

1. Reducing dividends to a recognized low substantial basis, say not over 5 per cent.; 4 per cent. might do.

2. A reduction of the number of trains which could be profitably employed only in flush times. It is very convenient to have a train every half hour or so, but when traffic is not there to support it, people might learn to do their railroad riding as they do their banking—within limited hours.

3. The schedules, which have been pushed up to almost unattainable execution, should be lengthened. The passenger would rather be sure that he is to arrive at his journey's end on time than hold in his hand a fast time-table and arrive 3 to 6 hr. late, as is a common experience. It may be counter to the spirit of the age, but possibly going a little slower on the railroads will be quite as healthy as a slowdown in other directions.

Money is reasonably plenty; collections fair. Stocks of merchandise are being run rather close for comfort, so that later on if we have good crops and the balance of trade continues anything like its recent showings we shall all be happy again with plenty to do.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—March business is about up to expectations. The first quarter of the year will fall somewhat below the sales of last year, but as spring approaches the orders are increasing, both in number and size, and especially in the latter, and the indications are now for about a normal business as April comes in. Stocks in the hands of retailers are not large and are likely to need frequent sorting up.

Throughout most of our farming country, and especially in the parts having mixed dairying, &c., there is ground for expecting a very fair spring trade. The consumers of goods over this extended area are on hand, and their wants will be steady and in the aggregate will be pretty large. These large and important sections of the country have not known much of the presence or as yet of the serious effects of the outside disturbances of last fall. For a month or thereabouts, in the pinch of the flurry and during the temporary currency stringency, they realized that something had gone wrong; but when that period passed over things again came around about in their usual way, and they may now reasonably be expected to continue so till another crop is at hand and takes its place as the important factor then in the situation. At that time the vital points to be considered will be: First, conditions of the crops, and, second, prices. Until the time for the settlement of these two questions we shall hope for a fair trade, and with average crops and reasonable prices the Northwest will be able to go through the year in good shape.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—During the past two weeks the business situation has remained practically the same as outlined in our former review. Business is steadily improving in a satisfactory manner, conditions are favorable and the outlook is encouraging.

At this season of the year pleasant and stormy days follow each other closely, which will probably represent

the weather conditions until about May 1. The agriculturists are taking prompt advantage of every favorable opportunity to make preparations for the necessary field work. A copious supply of moisture throughout the corn belt has placed the soil in admirable condition for the reception of seed grain, so that general conditions as they exist at the present time could not be materially improved.

The satisfactory volume of business now being transacted warrants the conclusion that a still heavier trade will develop just as soon as the weather settles and permits outdoor work of all kinds to proceed uninterruptedly.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—General conditions in this part of the country seem to be fairly satisfactory. The spring business is proving to be very good. Orders from traveling men, while not as large as they were last year, are quite plentiful and are well assorted, covering almost the entire line. Mail orders are heavy, and are better than they have been for some months.

Prices are being well maintained. We do not hear of any cutting going on, and there seems to be a pretty firm tone to the market.

Collections are improving, and our collections so far this month are much better than they were in February. During the past 30 days quite a number of new stocks have been sold in this city. This is a good indication of a revival of confidence in business.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The weather conditions during the past week or 10 days should somewhat improve trade, and, notwithstanding the fact that buyers have recently been very careful in their buying, largely limiting their orders to immediate wants or requirements, it can be safely stated that the weather conditions look encouragingly to improved trade. There has been some delay in placing orders for spring goods, but this condition cannot continue long, as it is now time to place orders for these goods, which, if not on hand when called for, will naturally reduce the merchant's trade.

There has probably never been a time since the years 1893 and 1894 when the general retail trade has been more careful in its purchases than since November last. As to how careful they have been in collecting accounts each dealer is naturally his own judge, but that effort is quite an important one.

We admit there has been something of a scare over the country because quite a number of men have been temporarily thrown out of employment, many of whom have suffered from having accumulated no savings during the past two years, when trade and employment have been so exceedingly good. There is more than one reason why many men were thrown out of employment, which was not alone due to the large increase in the number of persons coming from foreign countries during the past two or three years, estimated to be nearly equal to the thousands out of employment. Many manufacturers have been for years so largely engaged that they have been unable to give attention to the matter of keeping their works in proper condition, and when reduced trade came upon them the plants were closed in order that they might be put in good working condition. Again, trade has been so enormous (this reference is not made to general Hardware) that money was essential, and the interest rates on money had been so largely increased that a temporary holding up was more important to them than a continuance of operations to meet coming requirements. All these matters have combined to scare the trade throughout the country, and some employees temporarily out of employment have unfortunately suffered because they had saved no money.

In conversation a short time since with a person who has a large number of men in his employ, he referred to a man who had been in his service a number of years at a certain salary. This man had a family of five sons who had been well educated and were then in employment. The family had always lived well, but, notwithstanding, when the father died he owned the house the family lived in and two other houses, small, of course, but well rented. Another man who had been in his employ the same length of time at the same salary and with a smaller family of two sons died without having any money saved, which only goes to show what is possible if persons are careful and not too careless or extravagant with their income. Whether employer or employee, all should try to save money and prepare for contingencies which are liable to come up.

Market conditions are gradually improving. While it cannot be fully determined what 1908 crop conditions will be, yet, so far, matters look very encouraging and quite equal to the same time one year ago. Exports for the month of February exceed those of the same month one year ago. Money conditions have also wonderfully improved, and the rates on money are down to about the price that existed prior to the Wall Street trouble, and this, too, is an encouragement for the future.

New Orleans.

WOODWARD, WIGHT & CO.—We are all breathing a little more freely in New Orleans, now that the carnival is over and people have settled down to their normal gait and are able to pay a little closer attention to business than they have been during carnival week. For four or five days after the carnival there was quite a little spurt and it looked like old times to see good sized orders coming in, but it has slackened off again to the gait we had in February.

People, however, are all taking a little more cheerful view of the situation. All down here have made up their minds that they have got to face an economical régime for the next 6 or 12 months, and that the thing to do is to adapt themselves to the conditions and not cry over spilled milk.

Although it is pretty early in the year to tell about our crops, there have been no untoward developments so far, and with the customary optimism of the American merchant we believe that we are going to have good crops for the coming year, and that as a consequence the spirit of retrenchment is going to be in the end good for us, as it will get us on a more solid basis, and we will all get better value for the money we spend.

NOTES ON PRICES.

Wire Nails.—The market continues steady and the convenience of the trade is served by prompt shipments from the mills. Spring like weather has opened up trade to the extent of increasing demand within moderate limits. Specifications on contract orders and new business indicate conservatism on the part of buyers. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Sales of Wire Nails in small lots at store continue along moderate lines. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—Specifications continue to come out in a way that, contrasted with the movement of other mill products, is quite satisfactory. New business shows considerable improvement, which adds to the strength of the situation. Continued springlike weather has been a strong factor in the development of business, and will doubtless exert a stimulating influence all along the line. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The continued favorable weather and the opening up of spring trade have caused a larger demand for Wire Nails, the mills entering more business at present than for some time past. However, the volume of new business and specifications against contracts are lighter so far this year than usual, this being due

to the conservative attitude of jobbers in placing orders, the mills being in position to make prompt deliveries. There is also a feeling that nothing is to be gained by carrying heavy stocks, as higher prices on Wire Nails are not likely under present conditions. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—Existing prices were reaffirmed at the meeting of the Eastern Cut Nail Association held last week. It was believed that no additional business would result from lower prices, while maintaining present values more confidence in the future stability of the market would be assured and would aid in the return of confidence. The statement has been made that the present price of Cut Nails is entirely too low, in view of the cost of material and labor in making them. Most mills have cut down their production considerably as demand continues light. There is more or less irregularity in prices. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—There is comparatively little demand for Cut Nails in the local market. Regular prices are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—There is very little demand for Cut Nails from any source. Locally trade is extremely quiet and regular prices continue to be shaded 10 cents or more a keg. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The Eastern Cut Nail Association at its meeting held in Philadelphia on Wednesday, March 11, reaffirmed old prices. Demand continues very dull and there is more or less cutting in prices. The mills are still running very light in an effort to keep stocks as low as possible. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—The more general demand throughout the country has materially increased the volume of orders booked by the mills. The territory from which orders are received includes the South and Northwest. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Added to the demand from the South, orders are coming in more freely from Northern territory, with the result that distinct improvement is noted. Buyers are following orders with requests to hurry shipments, which indicates that consumers are getting busy. Prices are unchanged and firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The continued favorable weather has brought out considerable tonnage in Barb Wire from the Northwest, so that the buying movement is now more general throughout the country than for some time past. It is confidently believed that new tonnage will continue to expand with good weather and conditions and the opening up of spring trade. The mills are maintaining regular prices and the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Manufacturers of Wire Fencing have proceeded along conservative lines in placing orders for Wire, as have also other large buyers. When actual consumptive demand for Wire and Wire Fencing commences an increase of orders is anticipated by the mills. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—While business is developing in a satisfactory way, there are good prospects for an even better movement as the season advances. Manufacturers have been buying conservatively, and if the Fence trade overreaches their moderate provisions, as it reasonably may, they will be compelled to supplement their stocks by further purchases. Prices hold firm and steady. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New tonnage being placed with the mills is increasing, but buyers are placing orders conservatively in the belief that they will be able to get prompt shipment from the mills and fill their customers' orders promptly. As soon as the Fence building season actually starts a heavier buying movement is confidently anticipated. The mills report that they are maintaining prices and that the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Axes.—The unfortunate disturbance in the Axe market, referred to in our last issue, seems to be becoming more acute and difficult of correction, so far as next season's business is concerned, inasmuch as low quotations have been given wide circulation. The reduction in prices bears with especial heaviness, not only on the smaller manufacturers, but also on the jobbing trade, most of whom are carrying over considerable stocks purchased last year. Business booked this season promises to be light, although the low prices offered may tempt some large handlers with ample financial resources to purchase more freely than they would under other conditions. The general state of the market is not, however, such as to encourage speculative buying.

Cast Iron Hardware.—A tone of irregularity continues to prevail in the market for Cast Iron Hardware including Gate and Blind Hinges, Latches, Grindstone Fixtures, &c. Quotations are frequently shaded with a view to securing orders.

Cast Iron Soil Pipe.—In the market for Cast Iron Soil Pipe there seems to be some recovery from the extreme weakness of a short time ago. This is apparent in the tone of the trade rather than in actual prices, but in some cases there is a quotable improvement and a slight but appreciable increase in the inquiries for this material.

Agricultural Wrenches.—The line of Agricultural Wrenches, which has shown some weakness recently, is now in a condition bordering on demoralization and lower prices are reported than for a long period. While it is hardly possible to name a figure that will fairly cover all sections, the market may be represented in a general way by a discount of 80 and 10 per cent., or a trifle better.

Hatchets.—Prices on Hatchets, which have remained practically unchanged for many months, were reaffirmed last week by leading manufacturers. The market is represented by a base discount of 40 and 2½ per cent., beyond which there are further concessions to different classes of buyers.

Brass Cocks.—The extreme low quotations which have been made on Brass Cocks and Bibs have in some cases been withdrawn and prices show a slight tendency to improve.

Tacks.—The Tack market continues to be character-

ized by low and irregular prices, the result of sharp competition, and orders for moderate quantities may now be placed at low figures. The present level may be represented by a quotation on American Carpet and Cut Tacks of 90 and 35 to 90 and 40 per cent. discount, with additional discounts to larger trade.

Conductor Pipe.—A conference of manufacturers, representing perhaps 75 per cent. of the production of Conductor Pipe, Eaves Trough, &c., was held at Cincinnati last week in an effort to correct the irregularity in prices which has for some time prevailed in the market for those products. As a result quotations have been toned up appreciably, although some important interests are still maintaining an independent position. It is asserted, however, that the latter will co-operate in the attempt to maintain prices. The market may be represented in a general way by a discount on Galvanized Steel Pipe in Eastern territory of 70 and 10 per cent. and in Central territory of 75 and 10 per cent.

Rope.—Business continues light and orders are generally for small lots. Manufacturers are, as a rule, supplied with Fiber purchased at prices higher than those now ruling, so that Rope sold at present values does not show much if any profit. Still manufacturers appear anxious to make sales, especially of carload lots, on which low quotations are made. A comparison of values shows that Manila Fiber is 4 cents per pound lower than at this time last year, and that Sisal Fiber is 1¼ cents lower than at this time last year. Fair Current Manila Fiber and Sisal Fiber are now both quoted at 5¾ cents per pound. The retail trade throughout the country do not seem to be selling much Rope, as low quotations sent them does not bring orders. The following quotations for base sizes fairly represent the market: Pure Manila, 10¾ to 11½ cents; B quality grades down to 8 to 9 cents. Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—Marked improvement in the Glass situation is still lacking. Some Glass is being ordered from manufacturers, but prices lack uniformity and stability. Each factory is acting individually in the matter of prices and each is anxious to market its product. Under these conditions an open market is the result, and prices are favorable to the jobber. Locally business is light and prices more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to. The Pittsburgh Plate Glass Company has made a reduction in the price of Plate Glass, which averages, on the various sizes, about 25 to 30 per cent. It is understood that no contract orders are being accepted, but that the new prices are for immediate acceptance. This indicates that the reduction in prices may be temporary.

Linseed Oil.—The past few days of more springlike weather has brought out an improved demand for small lots of Oil. Interest in forward deliveries is lacking, as the views of buyers and crushers regarding price are still considerably far apart. Crushers are talking advances in prices, which are likely to come with a brisk demand. Local quotations are as follows: In five-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The prospect of the new crop of Turpentine reaching the market in a few weeks and general business conditions restrict demands to immediate requirements. The independent operators are supposed to have about 30,000 barrels of tank supply, which is an element of uncertainty, as this supply has been held for some time, but it may be necessary to dispose of it in some way and at some price. The New York market is represented by the following quotations: Oil Barrels, 51½ to 52 cents; Machine Made Barrels, 52 to 52½ cents.

Pecos Valley Lumber Company, Elkins, N. M., has put in a line of Hardware.

Pennsylvania Wholesale Hardware and Supply Association.

THE Pennsylvania Wholesale Hardware and Supply Association held its annual meeting on the 11th inst., at the Hotel Astor, New York City. The meeting was largely attended. The following officers were chosen for the ensuing year: President, James N. Kline, Kline & Co., Williamsport, Pa.; first vice-president, R. E. Weeks, Foote & Shear Company, Scranton, Pa.; second vice-president, H. M. Melchoir, Bright & Co., Reading, Pa.; treasurer, George D. Krause, George Krause Hardware Company, Lebanon, Pa. A pleasant feature of the gathering was a luncheon at which a number of informal addresses were made, several by invited guests. A. B. Stein, former president of the association, acted as toastmaster, and among those who spoke were T. B. Coles, American Steel & Wire Company; T. James Fernley, secretary of the National Hardware Association; Charles H. Rockwell, president of the Atlantic Glass Company, and R. R. Williams, Hardware editor of *The Iron Age*. In the evening a theater party was enjoyed.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM HORGAN & HOFFER, who have purchased the business of N. M. Jones in Friendship, Wis. The firm handles a general line of Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Wall Paper, &c.

FROM OLSON HARDWARE & IMPLEMENT COMPANY, Brandon, Minn., which has been incorporated to deal in General Hardware, Stoves, Implements, Paints and Sporting Goods.

FROM W. H. WILHELM, who has opened a new Hardware and Paint store, at 633 West North avenue, Baltimore, Md.

FROM ELDON HARDWARE & LUMBER COMPANY, Eldon, Mo., which has been incorporated with a capital of $20,000, and will handle Shelf Hardware, Stoves, Tinware, Implements, Paints, Sporting Goods and Harness.

FROM MCGRANE COMPANY, Buffalo, N. Y., which has been incorporated for $12,000 by J. I. McGrane, S. B. De Witt and T. B. Casey, and will in addition to conducting a General Hardware business, make a specialty of Gas Fixtures and Lighting Supplies, Bicycles and Motor Cycles.

FROM WATERTOWN HARDWARE COMPANY, Watertown, Tenn., H. & J. S. Phillips, proprietors, which has just opened a good sized store.

FROM NORMAN BAILEY, Christiana, Pa., who is about to add Farming Implements, &c., to the lines carried in connection with his General Hardware business.

FROM NEW AMSTERDAM HARDWARE COMPANY, 618 Amsterdam avenue, New York, which has lately opened up in business. In addition to carrying Hardware, Sewing Machines and Phonographs, the company will give attention to electrical work, locksmithing and general repairing.

FROM CHAPMAN HARDWARE COMPANY, Elmira, N. Y., successor to I. R. Chapman and dealer in Shelf Hardware, Stoves, House Furnishing Goods, &c.

Legget-Wisda Hardware Company, Ord, Neb., has been succeeded by Ord Mercantile Company.

TRADE ITEMS.

THE CONNEAUT SHOVEL COMPANY, Conneaut, Ohio, has within the last three months established branches at Portland, Ore.; Seattle, Wash.; Los Angeles and San Francisco, Cal., and Denver, Colo.

OWING to extended interests in other lines, E. R. Gibford has resigned as treasurer and sales manager of Gibford-Weiffenbach Company, Adrian, Mich., manufacturer of Red-E-for-Use and other brands of razor strops. G. U. Weiffenbach becomes general manager of the company. We are advised that there will be no change in the product or the quality standards of the company, which is equipped with a new factory, and will continue to give prompt and careful attention to orders.

THE Sioux City Iron Company, Sioux City, Iowa, wholesale Heavy Hardware, suffered a loss by fire March 5, which destroyed the stock in its main warehouse.

G. M. THUENAUER & BRO., 37 Park place, New York, importers of and merchants handling complete lines of Housefurnishing Goods, Kitchen Utensils, &c., have removed to 83-85 Worth street, New York.

THE WOLFF-LANE HARDWARE COMPANY, Pittsburgh, one of the oldest Hardware houses in that city, and in fact in the entire country, has been recently reorganized, the following officials having been elected: Edmund D. Graff, president; L. L. Banks, vice-president and treasurer; H. C. McKee, assistant treasurer, and John B. Maus, secretary and general manager. Prior to his connection with the company Mr. Maus was connected for 19 years with Kelly, Maus & Co., Chicago. Considerable new blood has recently been infused into the Wolff-Lane Company and it is the intention to push trade actively and extend its territory wherever feasible to do so.

THE ALBANY HARDWARE & IRON COMPANY, Albany, N. Y., has re-elected the Board of Directors which served during the past year. The following officers were chosen: President, Charles H. Turner; vice-president, W. I. Baker; secretary, W. J. Wackerhagen; treasurer, James K. Dunscomb.

IN the reference in our last issue to catalogue No. 22 issued by the Corbin Cabinet Lock Company a typographical error occurred in noting the number of pages, which should have been 264 instead 26. The catalogue represents the company's entire line of Cabinet Locks for innumerable purposes, together with some accessories, such as Knobs, Escutcheons and Striking Plates.

THE VULCAN TOOL MFG. COMPANY Quincy, Mass., has succeeded to the business formerly conducted by Alexander Clark Company and Gifford-Pinel Company. The company will manufacture a variety of Iron and Steel Tools of superior quality, making a specialty of the quarry and stone trade, and Contractors' Tools, including Picks, Sewer Tools and Tools for structural steel work.

HARTFORD MACHINE SCREW COMPANY, Hartford, Conn., has opened a New York office and warehouse at 88-90 Walker street, where a complete stock will be carried of Set and Cap Screws, Taper Pins, finished and case hardened Nuts, and practically all other goods made by the company.

THE NATIONAL ACME MFG. COMPANY, Cleveland, Ohio, has established a New York office at 77 White street, under the management of L. M. Waite, where a complete stock of Cap and Set Screws will be carried for the convenience of the trade.

THE R. E. DIETZ COMPANY, 60 Laight street, New York, has issued an illustrated catalogue, No. 40, 116 pages, representing an extensive line of Lanterns for all purposes and containing all details of interest to purchasers regarding fittings, packing, weights, dimensions of cases, cubic contents, &c. The catalogue illustrates nearly 100 styles of Dietz Lanterns, with a concise description of each, so that a person not familiar with the goods may order intelligently from it.

Dixon Hardware Company, Dixon, Mo., has been incorporated with a capital of $10,000.

AMONG THE HARDWARE TRADE.

Walther-Williams Hardware Company has succeeded Sexton-Walther Company, The Dalles, Ore., Mr. Sexton having retired. The company is carrying on a wholesale and retail business, and has a fine modern store covering 100 x 400 ft. of floor space.

The Baumann Hardware Company, Wausau, Wis., has been incorporated with a capital of $25,000, to conduct a retail Hardware, Stove, Implement and Sporting Goods business.

C. S. Lynde, Dalton, N. Y., has been succeeded by Lynde & Ryan, who will add Farm Machinery and Fertilizers to the stock formerly carried.

C. H. Reinholdt, Manning, Iowa, has been succeeded by C. H. Reinholdt & Co., who have been incorporated with a paid in capital of $17,000.

Horan & Hopper have succeeded N. M. Jones in the Hardware and Implement business at Friendship, Wis.

Hubert Day, Elyria, Ohio, has been succeeded in the Hardware, Tool, Paint and Sporting Goods business by Hubert Day & Sons.

The firm of French & Welch, Bismarck, N. D., general Hardware, Farm Machinery, Harness, &c., has been incorporated under the title of French & Welch Hardware Company, with a capital stock of $50,000. There will be no change of interest under the reorganization.

The Union Hardware Company, Hope, Ark., has recently been incorporated to do a wholesale and retail business in Shelf and Heavy Hardware, Farm Implements, Harness, Wagons and Buggies, Sash, Doors and Builders' Material. The officers of the new company are A. A. Gibson, president; J. H. Weaver, vice-president; S. A. Scott, secretary and treasurer; C. W. True, manager.

Walter Brummett and Edwin Morgan have formed a partnership and will engage in the Hardware and furniture business at Stephens, Ark.

The Melass, Johnson & Siebe Company, Stoughton, Wis, has sold the Implement and Machinery department of its business to Thos. Oscar of that city, but will continue the Hardware department as heretofore under the same firm name.

C. E. Baker has succeeded to the Hardware business of Ray & Rice, Camden, Ind.

Frank W. Prothero, Du Bois, Pa., has sold his Hardware, Stove, Paint, Vehicle and Harness business to Hibner-Hoover Hardware Company.

J. W. Timmons, who has been a salesman of the International Harvester Company for several years, has purchased the Hardware, Implement and Vehicle business of Ora Thomasson, Pine Valley, Ind.

H. J. Conant, proprietor of the Worcester Hardware Company, Worcester, Mass., has sold his interest and good will to J. F. Chandler, formerly of the firm of Chandler & Morse, Putnam, Conn. The business will be continued under the old style, under the management of H. B. Chandler.

The retail Hardware, Stove, Implement, Paint, Oil and Varnish business of Wm. Kerr & Sons, Union City, Ind., has been incorporated for $10,000 by J. H. Morris, Wm. Kerr, Thad. S. Barr and C. F. Kerr.

Turner Hardware Company, Magnolia, Ark., has been incorporated with a capital of $25,000 by J. W. Turner and others.

ized by low and irregular prices, the result of sharp competition, and orders for moderate quantities may now be placed at low figures. The present level may be represented by a quotation on American Carpet and Cut Tacks of 90 and 35 to 90 and 40 per cent. discount, with additional discounts to larger trade.

Conductor Pipe.—A conference of manufacturers, representing perhaps 75 per cent. of the production of Conductor Pipe, Eaves Trough, &c., was held at Cincinnati last week in an effort to correct the irregularity in prices which has for some time prevailed in the market for those products. As a result quotations have been toned up appreciably, although some important interests are still maintaining an independent position. It is asserted, however, that the latter will co-operate in the attempt to maintain prices. The market may be represented in a general way by a discount on Galvanized Steel Pipe in Eastern territory of 70 and 10 per cent. and in Central territory of 75 and 10 per cent.

Rope.—Business continues light and orders are generally for small lots. Manufacturers are, as a rule, supplied with Fiber purchased at prices higher than those now ruling, so that Rope sold at present values does not show much if any profit. Still manufacturers appear anxious to make sales, especially of carload lots, on which low quotations are made. A comparison of values shows that Manila Fiber is 4 cents per pound lower than at this time last year, and that Sisal Fiber is 1¼ cents lower than at this time last year. Fair Current Manila Fiber and Sisal Fiber are now both quoted at 5¾ cents per pound. The retail trade throughout the country do not seem to be selling much Rope, as low quotations sent them does not bring orders. The following quotations for base sizes fairly represent the market: Pure Manila, 10¾ to 11½ cents; B quality grades down to 8 to 9 cents, Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—Marked improvement in the Glass situation is still lacking. Some Glass is being ordered from manufacturers, but prices lack uniformity and stability. Each factory is acting individually in the matter of prices and each is anxious to market its product. Under these conditions an open market is the result, and prices are favorable to the jobber. Locally business is light and prices more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to. The Pittsburgh Plate Glass Company has made a reduction in the price of Plate Glass, which averages, on the various sizes, about 25 to 30 per cent. It is understood that no contract orders are being accepted, but that the new prices are for immediate acceptance. This indicates that the reduction in prices may be temporary.

Linseed Oil.—The past few days of more springlike weather has brought out an improved demand for small lots of Oil. Interest in forward deliveries is lacking, as the views of buyers and crushers regarding price are still considerably far apart. Crushers are talking advances in prices, which are likely to come with a brisk demand. Local quotations are as follows: In five-barrel lots, State and Wesern Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The prospect of the new crop of Turpentine reaching the market in a few weeks and general business conditions restrict demands to immediate requirements. The independent operators are supposed to have about 30,000 barrels of tank supply, which is an element of uncertainty, as this supply has been held for some time, but it may be necessary to dispose of it in some way and at some price. The New York market is represented by the following quotations: Oil Barrels, 51½ to 52 cents; Machine Made Barrels, 52 to 52½ cents.

Pecos Valley Lumber Company, Elkins, N. M., has put in a line of Hardware.

Pennsylvania Wholesale Hardware and Supply Association.

THE Pennsylvania Wholesale Hardware and Supply Association held its annual meeting on the 11th inst., at the Hotel Astor, New York City. The meeting was largely attended. The following officers were chosen for the ensuing year: President, James N. Kline, Kline & Co., Williamsport, Pa.; first vice-president, R. E. Weeks, Foote & Shear Company, Scranton, Pa.; second vice-president, H. M. Melchoir, Bright & Co., Reading, Pa.; treasurer, George D. Krause, George Krause Hardware Company, Lebanon, Pa. A pleasant feature of the gathering was a luncheon at which a number of informal addresses were made, several by invited guests. A. B. Stein, former president of the association, acted as toastmaster, and among those who spoke were T. B. Coles, American Steel & Wire Company; T. James Fernley, secretary of the National Hardware Association; Charles H. Rockwell, president of the Atlantic Glass Company, and R. R. Williams, Hardware editor of *The Iron Age*. In the evening a theater party was enjoyed.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM HORGAN & HOPPER, who have purchased the business of N. M. Jones in Friendship, Wis. The firm handles a general line of Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Wall Paper, &c.

FROM OLSON HARDWARE & IMPLEMENT COMPANY, Brandon, Minn., which has been incorporated to deal in General Hardware, Stoves, Implements, Paints and Sporting Goods.

FROM W. H. WILHELM, who has opened a new Hardware and Paint store, at 633 West North avenue, Baltimore, Md.

FROM ELDON HARDWARE & LUMBER COMPANY, Eldon, Mo., which has been incorporated with a capital of $20,000, and will handle Shelf Hardware, Stoves, Tinware, Implements, Paints, Sporting Goods and Harness.

FROM MCGRANE COMPANY, Buffalo, N. Y., which has been incorporated for $12,000 by J. I. McGrane, S. B. De Witt and T. B. Casey, and will in addition to conducting a General Hardware business, make a specialty of Gas Fixtures and Lighting Supplies, Bicycles and Motor Cycles.

FROM WATERTOWN HARDWARE COMPANY, Watertown, Tenn., H. & J. S. Phillips, proprietors, which has just opened a good sized store.

FROM NORMAN BAILEY, Christiana, Pa., who is about to add Farming Implements, &c., to the lines carried in connection with his General Hardware business.

FROM NEW AMSTERDAM HARDWARE COMPANY, 618 Amsterdam avenue, New York, which has lately opened up in business. In addition to carrying Hardware, Sewing Machines and Phonographs, the company will give attention to electrical work, locksmithing and general repairing.

FROM CHAPMAN HARDWARE COMPANY, Elmira, N. Y., successor to I. R. Chapman and dealer in Shelf Hardware, Stoves, House Furnishing Goods, &c.

Legget-Wisda Hardware Company, Ord, Neb., has been succeeded by Ord Mercantile Company.

TRADE ITEMS.

THE CONNEAUT SHOVEL COMPANY, Conneaut, Ohio, has within the last three months established branches at Portland, Ore.; Seattle, Wash.; Los Angeles and San Francisco, Cal., and Denver, Colo.

OWING to extended interests in other lines, E. B. Gibford has resigned as treasurer and sales manager of Gibford-Weiffenbach Company, Adrian, Mich., manufacturer of Red-E-for-Use and other brands of razor strops. G. U. Weiffenbach becomes general manager of the company. We are advised that there will be no change in the product or the quality standards of the company, which is equipped with a new factory, and will continue to give prompt and careful attention to orders.

THE Sioux City Iron Company, Sioux City, Iowa, wholesale Heavy Hardware, suffered a loss by fire March 5, which destroyed the stock in its main warehouse.

G. M. THURNAUER & BRO., 37 Park place, New York, importers of and merchants handling complete lines of Housefurnishing Goods, Kitchen Utensils, &c., have removed to 83-85 Worth street, New York.

THE WOLFF-LANE HARDWARE COMPANY, Pittsburgh, one of the oldest Hardware houses in that city, and in fact in the entire country, has been recently reorganized, the following officials having been elected: Edmund D. Graff, president; L. L. Banks, vice-president and treasurer; H. C. McKee, assistant treasurer, and John B. Maus, secretary and general manager. Prior to his connection with the company Mr. Maus was connected for 19 years with Kelly, Maus & Co., Chicago. Considerable new blood has recently been infused into the Wolff-Lane Company and it is the intention to push trade actively and extend its territory wherever feasible to do so.

THE ALBANY HARDWARE & IRON COMPANY, Albany, N. Y., has re-elected the Board of Directors which served during the past year. The following officers were chosen: President, Charles H. Turner; vice-president, W. I. Baker; secretary, W. J. Wackerhagen; treasurer, James K. Dunscomb.

IN the reference in our last issue to catalogue No. 22 issued by the Corbin Cabinet Lock Company a typographical error occurred in noting the number of pages, which should have been 264 instead 26. The catalogue represents the company's entire line of Cabinet Locks for innumerable purposes, together with some accessories, such as Knobs, Escutcheons and Striking Plates.

THE VULCAN TOOL MFG. COMPANY Quincy, Mass., has succeeded to the business formerly conducted by Alexander Clark Company and Gifford-Pinel Company. The company will manufacture a variety of Iron and Steel Tools of superior quality, making a specialty of the quarry and stone trade, and Contractors' Tools, including Picks, Sewer Tools and Tools for structural steel work.

HARTFORD MACHINE SCREW COMPANY, Hartford, Conn., has opened a New York office and warehouse at 88-90 Walker street, where a complete stock will be carried of Set and Cap Screws, Taper Pins, finished and case hardened Nuts, and practically all other goods made by the company.

THE NATIONAL ACME MFG. COMPANY, Cleveland, Ohio, has established a New York office at 77 White street, under the management of L. M. Waite, where a complete stock of Cap and Set Screws will be carried for the convenience of the trade.

THE R. E. DIETZ COMPANY, 60 Laight street, New York, has issued an illustrated catalogue, No. 40, 116 pages, representing an extensive line of Lanterns for all purposes and containing all details of interest to purchasers regarding fittings, packing, weights, dimensions of cases, cubic contents, &c. The catalogue illustrates nearly 100 styles of Dietz Lanterns, with a concise description of each, so that a person not familiar with the goods may order intelligently from it.

Dixon Hardware Company, Dixon, Mo., has been incorporated with a capital of $10,000.

AMONG THE HARDWARE TRADE.

Walther-Williams Hardware Company has succeeded Sexton-Walther Company, The Dalles, Ore., Mr. Sexton having retired. The company is carrying on a wholesale and retail business, and has a fine modern store covering 100 x 400 ft. of floor space.

The Baumann Hardware Company, Wausau, Wis., has been incorporated with a capital of $25,000, to conduct a retail Hardware, Stove, Implement and Sporting Goods business.

C. S. Lynde, Dalton, N. Y., has been succeeded by Lynde & Ryan, who will add Farm Machinery and Fertilizers to the stock formerly carried.

C. H. Reinholdt, Manning, Iowa, has been succeeded by C. H. Reinholdt & Co., who have been incorporated with a paid in capital of $17,000.

Horan & Hopper have succeeded N. M. Jones in the Hardware and Implement business at Friendship, Wis.

Hubert Day, Elyria, Ohio, has been succeeded in the Hardware, Tool, Paint and Sporting Goods business by Hubert Day & Sons.

The firm of French & Welch, Bismarck, N. D., general Hardware, Farm Machinery, Harness, &c., has been incorporated under the title of French & Welch Hardware Company, with a capital stock of $50,000. There will be no change of interest under the reorganization.

The Union Hardware Company, Hope, Ark., has recently been incorporated to do a wholesale and retail business in Shelf and Heavy Hardware, Farm Implements, Harness, Wagons and Buggies, Sash, Doors and Builders' Material. The officers of the new company are A. A. Gibson, president; J. H. Weaver, vice-president; S. A. Scott, secretary and treasurer; C. W. True, manager.

Walter Brummett and Edwin Morgan have formed a partnership and will engage in the Hardware and furniture business at Stephens, Ark.

The Melass, Johnson & Siebe Company, Stoughton, Wis, has sold the Implement and Machinery department of its business to Thos. Oscar of that city, but will continue the Hardware department as heretofore under the same firm name.

C. E. Baker has succeeded to the Hardware business of Ray & Rice, Camden, Ind.

Frank W. Prothero, Du Bois, Pa., has sold his Hardware, Stove, Paint, Vehicle and Harness business to Hibner-Hoover Hardware Company.

J. W. Timmons, who has been a salesman of the International Harvester Company for several years, has purchased the Hardware, Implement and Vehicle business of Ora Thomasson, Pine Valley, Ind.

H. J. Conant, proprietor of the Worcester Hardware Company, Worcester, Mass., has sold his interest and good will to J. F. Chandler, formerly of the firm of Chandler & Morse, Putnam, Conn. The business will be continued under the old style, under the management of H. B. Chandler.

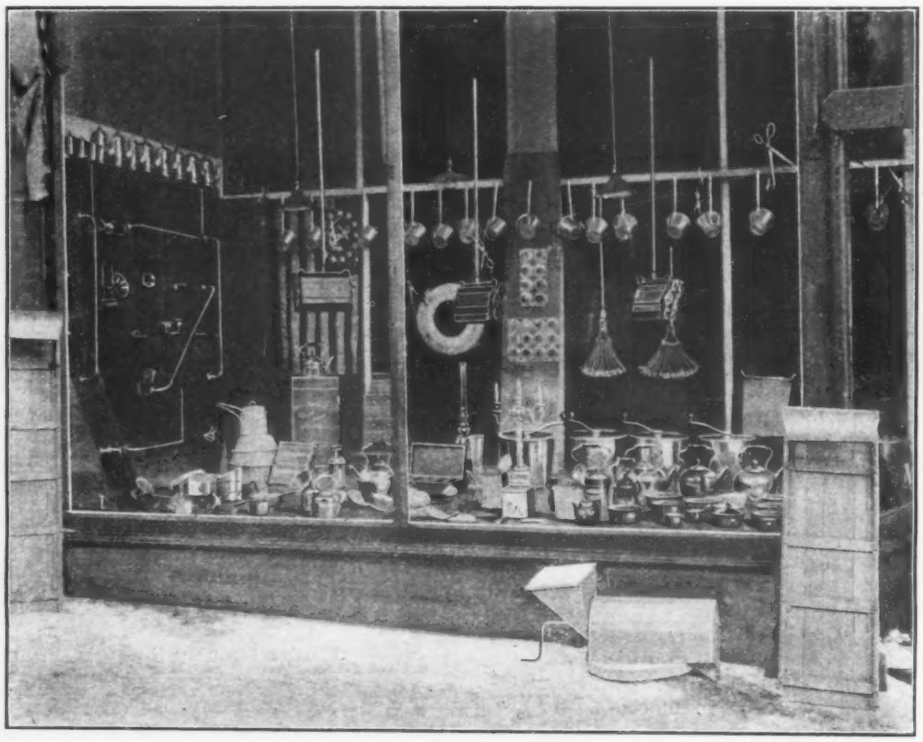
The retail Hardware, Stove, Implement, Paint, Oil and Varnish business of Wm. Kerr & Sons, Union City, Ind., has been incorporated for $10,000 by J. H. Morris, Wm. Kerr, Thad. S. Barr and C. F. Kerr.

Turner Hardware Company, Magnolia, Ark., has been incorporated with a capital of $25,000 by J. W. Turner and others.

A HARDWARE GIRL.

IN a merchants' carnival at Caruthersville, Mo., the Caruthersville Hardware Company was represented by the businesslike Hardware girl whose photograph is reproduced herewith. She marched in the parade in which the leading merchants of the city were represented by young women dressed to represent their business. Her dress consisted of a tan hunting coat and a skirt of green satin, which furnished a brilliant background for the numerous articles which were sewed onto it. Every available kind of Hardware was represented in her costume, including spurs for her heels, leggins and a border on her skirt made of Scissors and Jack Chain. Dog Collars were used for belt and collar. The hat was trimmed with Teaspoons all the way round the crown, with crossed Forks and an Egg Beater standing up in front. The skirt weighed 26 lb. A Butcher Knife stuck in the crease of the hat represented a feather. The girl carried a Gun, which she fired from time to time, and naturally attracted a great deal of attention. Although the idea was one of the best advertising schemes the company ever employed, it did not entail much work, as the entire costume was made in one afternoon.

A Hardware Girl.



Display of Household Goods, Nickel Plated Ware, &c.

HOUSEHOLD GOODS WINDOW DISPLAY.

"FOR our retail trade we find that good show windows, well and frequently dressed, are the best advertisement we can have." This is the experience of M. R. Manhard & Son, Marquette, Mich., one of whose window exhibits is here reproduced to give point to their remark. The firm's windows are large, measuring 14 ft. wide by 6½ ft. deep, and their floors are low, so that goods moderately elevated are not too far above the eye of the passer-by. The window illustrated will be recognized as an excellent display of Household Goods sure to interest a woman. These include Nickel Plated Ware, Carpet Sweepers, Fancy Teapots, Granite Ware, Bread Mixers, Bathroom Fixtures, Kitchen Utensils, &c.

THE PRITCHARD-STRONG COMPANY, Rochester, N. Y., announces that this year it will furnish free the striking life size lithograph of Uncle Obediah, with which many in the trade are familiar, with either of two assortments of Prisco Lanterns, instead of only one assortment, as in 1907. The company's new 1908 assortment consists of a small sample line of Lanterns, not more than a single Lantern of any one number. Every item is referred to as a fast selling number, and Uncle Obediah is relied upon to attract customers.

THE RED JACKET MFG. COMPANY, Davenport, Iowa, has received a diploma for its Pumps, Cylinders and supplies exhibited by H. G. Chamberlin Company, Oklahoma City, at the first annual fair of Oklahoma, October 5 to 16, 1907. The company states that this was the only award given for a display of this line.

QUESTION BOX AT THE COLORADO CONVENTION.

IN our last issue we presented a report of the proceedings of the annual meeting of the Colorado Retail Hardware Association at Denver, with the exception of the Question Box discussion. This was a valuable feature of the convention. Some of the questions, with the substance of the replies, were as follows:

1. What percentage of handling sales should expense be?

Ordinarily it seemed that expense would average 12½ to 16½ per cent. It was asked whether this should be figured on gross sales or on the capital stock invested and the answer was on the gross sales.

2. Will $100 go further in advertising in local newspapers or in sending out circulars or personal letters?

After a lengthy discussion it was decided that this was an open question, depending on local conditions. A good local newspaper deserves support, but the value of the advertising depended a good deal upon its makeup. Mr. Steele stated that his store was so well and favorably known that it was unnecessary for him to advertise in the papers. He made his customers believe that he was a good fellow by passing out good cigars and Jackknives. Mr. Roberts said that he believed in heart to heart talks with those from whom his trade was drawn and in telling in his newspaper advertising the facts relating to his goods, using illustrations wherever possible. He believed in supporting the papers in his town. President Harding believed that locals or reading notices were more effective than a regular advertisement, especially if you had anything particular to say.

3. Have you got nerve enough to ask for interest on an overdue back account?

Some of the members had the necessary nerve, but others confessed that they had not. The general opinion, however, prevailed that it was entirely fair and just to ask for interest on such accounts. Mr. Clatworthy stated that he added interest on over due bills and got it sometimes, but in other cases had to take it off where the customer made a very vigorous kick. Mr. Moys thought that merchants should educate their customers in a farming community who only wanted a settlement once or twice a year so that they should not expect more consideration than other customers who are only given 10 days to settle. If 30 day settlements were insisted upon the farmers could readily get the money at the banks. Mr. Dye said that settlement should certainly be made in 30 days, but he handled the matter in a different fashion. On his bills it was stated that "If paid by the 15th," so much deduction would be allowed. The percent. was not stated but the amount was as much as could be afforded on the line sold. If the account were not paid by the date named it was understood that the customer should pay the full amount of the bill, and if it ran longer than the time stipulated for net he arranged to get a note drawing 10 per cent. interest.

Mr. Coddington explained that his terms were 10 per cent., 30 days, this being printed on the billheads. When due, if unpaid, notes or mortgages for any amount were taken. He had taken one as low as $14, and he said that at the time of coming to the convention his firm had only one bill amounting to $20 on back account, a statement which astonished his brother merchants and evoked applause.

4. As we seem to be drifting to a cash basis should we not encourage this method of doing business?

The opinion was unanimous that the cash basis of conducting business should be encouraged in every way possible.

5. Should we not organize a State insurance company?

The answer was that owing to the heavy expense of starting such a company under the laws of Colorado it was not feasible.

6. Ought time prices on implements be higher than cash prices?

The answer was an emphatic yes. It was suggested that terms should be cash in 30 days, with 5 per cent. discount allowed for prompt payment. After 30 days a note with interest should be required.

7. Why should not the Colorado jobber-retailer give the country merchants some of the profits?

Mr. Roberts stated that there was nothing of this sort in Nebraska, but he thought the solution rested with the merchants themselves, who should take a united stand in opposition. The position should be taken that jobbers are in the jobbing business and not in the retail and that the retailer expects them to protect his interests. Mr. Dye suggested writing the jobber who ships to a retailer's customer asking for a credit memorandum.

MERCHANTS' DAMAGE CLAIMS AGAINST RAILROAD COMPANIES.

IT is a very slow and tedious task to collect a claim against a railroad for a shipment damaged in transit, but no merchant can afford to neglect these losses, which amount to a considerable sum in the course of a year. The general rule of law is that a railroad must deliver a shipment in as good condition as it received the property, and settle with the owner for any loss or damage in transit. Claim agents are fertile in excuses for declining claims, but there are only a few cases where they are legally justified in refusing to pay. Under the common law and the laws of all the States, they are not liable if the loss or damage is caused by an act of God, the public enemy or the act of government. They must pay for everything else.

The legal term "act of God" is somewhat indefinite and covers a remote class of casualties. Fire caused by lightning, an unusual flood which could not be foreseen, an earthquake, and in some cases a wreck caused by a washout or landslide, and other similar manifestations of nature come within this rule, if the railroad could not, by diligence, guard against them and protect the property. The government in this country seldom does anything to cause damage to freight, excepting in the Southern States, which are subject to quarantine regulations. If a box of Hardware were rusted or damaged as a result of fumigation, the owner could not recover because it is an act of the Government. Since the Civil War we have had no "public enemy" in this country in the form of an army, but the courts of many of the States have held that an overwhelming mob is a "public enemy," and that the railroad is not responsible if it was unable, by diligent effort, to protect the property destroyed.

These questions may be of great interest to the lawyers, but they seldom concern the merchant who wants to recover for a lot of broken, damaged or rusted Hardware. The excuses that a railroad may legally offer for refusing a claim are mentioned, merely to show that they can seldom be honestly invoked. The railroad is responsible for all ordinary loss and damage. Rates have been adjusted to cover this liability. Hardware pays higher rates than pig iron, chiefly because of the risk of damage, and the merchant is entitled to the "insurance" which he has paid for. The railroads do not refuse the claims of the mail order houses, and they must be equally fair with the smallest merchant.

The most important thing when a shipment is received in bad order is to insist that the railroad agent shall acknowledge the damage on the freight bill in his own handwriting. This acknowledgment by the railroad in writing is the most important document in the settlement of every claim. If the merchant does not obtain it his claim will be turned down by the claim department of the road. The claim agent may make other excuses, but his real reason for refusing to pay is that the consignee has no legal, "documentary," evidence that the property was damaged. It is important that the railroad agent should state in his notation on the freight bill what articles or parts are broken or damaged, and he has authority to do this. Attention to this little detail is nine-tenths of the battle in collecting a claim.

The agent keeps a record of all shipments that he delivers in bad order, and on most railroads he is required to make a report to the general office or the claim department at the time of delivery. It is a useful and necessary precaution to show him the exact extent of the damage, and impress it clearly on his mind, so he will remember the circumstances when the claim agent inquires of him regarding the shipment. A railroad is like any other corporation. It cannot pay out the money

of its stockholders without having exact, documentary evidence to justify the payment. The clerk in the claim department who receives the papers on a claim and rejects or "vouchers" the amount never saw the shipment, does not actually know that such a shipment was made or that it was damaged, knows nothing about the value of the goods, and cares very little about anything excepting that he must have documents to show for any money that he orders paid. He does not look for evidence to warrant payment, but it does not take him long to find a flaw that justifies refusing the claim. He is deaf, dumb and stupid, and blind to everything except documents, and it is necessary to furnish the documents to get attention. Mail order houses and other large concerns get results on their claims by taking care in presenting them.

When a claim is presented to the agent three documents are usually required:

The freight bill, with agent's notation of damage.

The original invoice to show the value of the goods.

And an accurate description of the nature and amount of the damage.

Some roads also require the bill of lading. The agent should forward these with his own report to the claim department. It is practically useless to present a claim unless the agent will indorse it. A book of some kind should be kept as a record of claims that have been filed, so that during the next six months or a year idle moments can be turned to account by going over the book and writing polite inquiries to know when the claim will have attention. The most important entry to be made in this book is the railroad file number of the claim, which should be mentioned in every letter regarding it.

Where a railroad does not pay just claims within six months it would be well to compare notes with other merchants in the town, and find out if they have had the same experience. In such a case they should have a meeting, get in touch with the members of the Legislature from their district, the members of Congress and the Senators for their State. Action along this line is not expensive and is more likely to bring results than a lawsuit.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

MAPLE CITY MFG. COMPANY, Monmouth, Ill.: Catalogue illustrating Howland Pump and Valve Oilers, Polished Steel, Copperized Steel and Solid Brass Spring Bottom Oilers, Special Pattern Drip Oilers, Torches, Lamps, &c.

DIAMOND RUBBER COMPANY, Akron, Ohio: Catalogue, superceding all previous issues, devoted to Mechanical Rubber Goods, including Belting, Hose, Packing, Respirators, Diaphragms, Plumbers' Supplies, &c.

STRATTON LEVEL COMPANY, successor to Stratton Brothers, Greenfield, Mass.: Catalogue F, relating to high grade Spirit Levels. The company also publishes an instructive pamphlet entitled "Valuable Hints," dedicated to the trade and mechanic, which will be forwarded free of charge by the company upon application by merchants.

FEDERAL STEEL FIXTURE COMPANY, Chicago, Ill.: Catalogues and price-lists relating to Steel Lockers and Wardrobes, also to steel factory equipment. The latter line includes Steel Shelving, Boxes, Core Trays, Barrels, Foreman Desks, Shop Benches, Tool Racks, Trucks, &c.

REPUBLIC FORGING & VISE COMPANY, Cleveland, Ohio, Surpless, Dunn & Co., New York and Chicago, sole agents: Illustrated price-list of Anvils, Solid Box Blacksmiths' Vises, and Machinists', Farmers' and Coachmakers' Vises.

SPRINGFIELD WIRE SCREEN COMPANY, Springfield, Ill.: Illustrated catalogue devoted to Smillie's High Grade Antimalarial Door and Window Screens.

MILWAUKEE TACK COMPANY, Milwaukee, Wis.: Illustrated catalogue and price-list descriptive of the company's product, which consists of all forms and sizes of Tacks, Brads and special Nails in steel and brass, including also a large variety of Wire Staples.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.: Attractive booklet referring to Lawn Mowers, especially Motor Lawn Mowers.

CINCINNATI TOOL COMPANY, Cincinnati, Ohio: Illustrated catalogue containing price-lists referring to the company's line of Hardgrave Brand Tools, including Hollow Augers, Clamps, Drills, Drivers, Pliers, Wrenches, &c., and Perfection Roller Blotter Baths.

GIFFORD-WOOD COMPANY, Arlington, Mass.: Illustrated catalogue of Ice Handling Machinery, Ice Tools, &c., with revised price-lists for summer of 1908.

H. B. SHERMAN MFG. COMPANY, Battle Creek, Mich.: Illustrated catalogue No. 18, referring to Hose Brass Goods, Lubricators, Fittings, Oil Cups, Pump Leathers, &c.

BOSTON BOLT COMPANY, Boston, Mass.: Illustrated catalogue of Bolts, Nuts, Rivets, Washers, &c., Expansion Bolts, Jack Screws, Turnbuckles, &c.

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo.: Illustrated catalogue of an extensive line of Bicycles and Bicycle Sundries. The Bicycles are shown in the colors in which they are furnished.

KNAPP & SPENCER COMPANY, Sioux City, Iowa: Budget of leaves for insertion in the company's loose leaf catalogue.

FERGUSON MFG. COMPANY, Bellevue, Iowa: Mailing card referring to Kegler's Patent Galvanized Steel Chain Pumps.

EDWARD DARBY & SONS COMPANY, Philadelphia, Pa.: Illustrated catalogue No. 42, referring to Bird Cages and budget of other printed matter, referring to Screens, Sieves and Riddles, Cleaning Brushes, Mouse Traps, Pendar Metal Lockers, &c.

H. L. BENNETT & Co., Westerville, Ohio: Illustrated mailing card, referring to Stump Pullers, Tile Ditchers, Corn Harvesters, &c.

DUANE H. NASH, INC., Millington, N. J.: Illustrated catalogue referring to the Acme Pulverizing Harrow, Clod Crusher and Leveler, with booklet entitled "A Perfect Seed Bed," containing a series of articles of interest to agriculturalists.

EDWIN B. STIMPSON COMPANY, 31 Spruce street, New York: Illustrated catalogue of Perforated Metals, with circular referring to Rivets, Washers, &c.

DOVER STAMPING & MFG. COMPANY, Cambridge, Mass.: Illustrated catalogue No. 33, referring to Stamped Ware, Japanned and Pieced Tinware, Black and Galvanized Sheet Steel Ware, Kitchen Furnishing Goods and Dover Egg Beaters.

UNION STEEL SCREW COMPANY, Cleveland, Ohio: Illustrated price-list of Wood Screws, Bolts and Rivets.

MONTGOMERY & Co., 105-107 Fulton street, New York: Convenient illustrated handbook of Tools, many of which are quoted at net prices.

HUBER ACCOUNT REGISTER COMPANY, Buffalo, N. Y.: Illustrated circular, referring to the Huber account system for retail merchants.

SAMUEL HARRIS & COMPANY, Chicago: Illustrated pocket catalogue containing price-lists of tools and supplies for machinists and manufacturers.

FANNER MFG. COMPANY, Cleveland, Ohio: Illustrated catalogues, referring respectively to extensive lines of Brass Bedsteads, Stove Trimmings and Hardware specialties.

ROBERT C. REEVES COMPANY, 187 Water street, New York: 1908 illustrated catalogue of Agricultural and Horticultural Implements, Machinery, Seeds, Fertilizers, &c.

AMERICAN STOVE BOARD COMPANY, Chicago: Revised price-list of Stove Boards for 1908.

Parcel Post Debate in the House.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 17, 1908.

THE closing hours of the debate on the annual post office appropriation bill, which was on the eve of passage when last week's issue of *The Iron Age* went to press, were marked by an unexpectedly animated discussion of the Postmaster-General's rural parcel post project and a stubborn but unsuccessful fight to saddle it as a "rider" upon the pending measure.

It had been assumed that the intimation by Chairman Overstreet of the House Post Office Committee that he would make a point of order against any parcel post amendment, would deter members from offering such provisions after the close of general debate. Two members of the House, however, insisted upon going upon the record, Messrs. Griggs of Georgia, and Sims of Tennessee, both of whom have introduced bills drawn either by the Post Office Department or in accordance with the Postmaster-General's suggestions. These two members therefore collaborated in the framing of an amendment offered by Mr. Griggs, as follows:

Section 1. That beginning July 1, 1908, there shall be a parcel post limited to 11 lb. on every rural route in the United States. Said parcel post shall be confined exclusively to the rural route upon which the parcel originates and its rural-route connections, and shall not extend beyond said route upon which it originates and routes with which said route connects directly, without the intervention of railroad mail service, star route, messenger, or any other form of mail service.

Sec. 2. That the rate of postage on such packages shall be 5 cents for packages weighing not more than 3 lb, 7 cents for packages weighing not more than 5 lb., 10 cents for packages weighing more than 5 and not more than 8 lb., and 15 cents for all packages weighing more than 8 and not more than 11 lb.

Sec. 3. That the provisions of this act shall not apply to matter which is classified by law as first, second and third class, nor affect existing rates of postage thereon; nor shall there be accepted for transportation and delivery, as mail matter, by rural mail carriers, any intoxicating liquors (ardent, vinous, spirituous or malt), habit-forming drugs, explosives, liquids liable to explosion by shock or jar or to spontaneous combustion, or any matter exhaling bad odor, or which from its nature or constituency is liable to contaminate or damage the mails.

Sec. 4. That the compensation of rural carriers be increased to the extent of all receipts for such parcel post service hereby established, on each route, respectively, not to exceed $300 per annum to each carrier, to be paid under such rules and regulations as may be established by the Postmaster-General.

Chairman Overstreet said he would reserve the point of order to enable Mr. Griggs to explain his amendment, which he did at some length, declaring that while other loosely drawn bills had been introduced he had taken special pains with his measure, believing that a law to stand the test ought to be like the pasture fences of Georgia—"pig tight, horse high and bull strong."

A Spirited Debate.

Mr. Sims followed in support of the amendment, precipitating an exceedingly spirited debate, a verbatim report of which will no doubt be of great interest to the readers of *The Iron Age*. It is as follows:

Mr. SIMS: This amendment simply provides for the establishment upon rural delivery routes of a parcel post confined to the rural routes upon which the parcel is mailed, which was recommended as a part of the general recommendation of the Postmaster-General in his last report. I have received numbers of letters from parties opposing the bill. These letters usually come from retail merchants throughout the rural sections where these routes are. This amendment will not injure the retail merchants, but will be of great benefit to them, inasmuch as they will have the exclusive privilege of using the parcel post, and it will be a great benefit to the people who are patrons of these routes.

Mr. HUMPHREYS of Mississippi: What do you mean by "exclusive privilege"?

Mr. SIMS: When I say "exclusive privilege," I mean this: That the great department stores in the cities that are not situated upon these routes cannot use them, and therefore the retail merchants who are situated upon them can only use them, and in that sense it is an exclusive use.

Mr. FITZGERALD of New York: Why does the gentleman wish to discriminate against the department stores in favor of the retail stores on the routes? Why not give all the privilege alike?

Mr. SIMS: My reply is that the opposition is made by retail merchants situated on these "roots," to use Republican pronunciation, when, in fact, this amendment is in their interest.

Mr. MADDEN: Does the gentleman not believe it would be possible for a mail order house doing business outside of a particular route to freight its goods to a town within the route, and then, by means of the route, to have them carried by mail to the people living on the route, and thereby destroy the business of the local merchant?

Mr. SIMS: To ask what is a possibility is one thing; to ask what is practicable or profitable is another thing.

Mr. MADDEN: Does the gentleman believe it would not be practicable?

Mr. SIMS: I do not believe the department stores can profitably take advantage of this legislation.

Mr. MADDEN: Does not the gentleman conceive that a bill like this would do the very thing that he seeks to prevent being done?

Mr. SIMS: Do what?

Mr. MADDEN: To give all the business within the mail route to the large mail order houses in the big cities and take away from the merchants doing a local business all the business that they could otherwise do.

Mr. SIMS: I do not see how it would be possible under this bill.

Mr. OVERSTREET: I move that all debate on the paragraph and amendments thereto close in five minutes.

Mr. Johnson of South Carolina, Mr. Griggs, Mr. Gaines of Tennessee, and others rose.

Mr. OVERSTREET: I made that motion for the purpose of seeing how many gentlemen would rise and how many amendments were in preparation.

Mr. GAINES of Tennessee: I hope the gentleman will not insist on that. This is an important matter, and we want to get as much light as possible.

Mr. OVERSTREET: I move that all debate on the pending amendment close in five minutes.

The motion was agreed to.

Mr. SIMS: In further reply to the gentleman from Illinois [Mr. Madden], I cannot conceive how the great department stores in his city could send their goods down into my district or the district of the gentleman from Georgia in such a way as to deprive the merchants there of the benefits intended to be conferred under this section.

Mr. GAINES of West Virginia: Would the gentleman favor a proposition that would permit the department stores to use the parcel post?

Mr. SIMS: I do not want them to use it upon equal terms with the local merchant, because it would destroy the local merchant. The Postmaster-General has not recommended such law.

Mr. GAINES of West Virginia: Then is not the whole proposition wrong? If it is right to apply to the people of one place, is it not right to apply to the people of another place? As far as I am concerned, I am opposed to this whole parcel post business.

Mr. SIMS: There is a great difference between sending a package on a rural route extending not to exceed 25 miles for 5 cents, and sending a similar package of equal weight from San Francisco to my district for 5 cents. A flat parcel post would discriminate absolutely against the local merchant.

Mr. MADDEN: Does the gentleman concede the right of mail order houses to freight their goods to any town in the United States and then mail them at the post office within that town at the reduced rate to any person living on a rural delivery route?

Mr. SIMS: No, indeed; and I do not conceive that this amendment provides for that or makes it practically possible.

Mr. MADDEN: I beg the gentleman's pardon. I did not ask if this amendment provided for it or not. What I wanted to know was whether the gentleman believed that the mail order merchant could do that under this law.

Mr. SIMS: I do not think so; such is not the intention.

Mr. MADDEN: Is there anything in the law to prevent any citizen of the United States, no matter where he is located, from sending through the mails anything that may be required by any citizen in any rural district?

Mr. SIMS: He can send it but he must pay the rate now prevailing for such a service; he could not get the benefit of the reduced rate under this bill unless mailed originally on the route.

Mr. MADDEN: If he sent it by railroad, by freight, to a town within the route, would he not then have the right to mail it from that town to any point within the route?

Mr. SIMS: Not as I understand it; that would be an evasion; but if he would have such a right we will offer an amendment so as to exclude it. Now another point. In the parcel postal service, as recommended by the Postmaster-General, there is no recommendation for additional compensation for the rural carriers. If the service

is established, the compensation ought to be reasonably and equitably increased. The bill I introduced, and above referred to, provides that they shall have all of the receipts on the route up to and not exceeding $300 per annum, to be paid under such regulations as the Postmaster-General may make. I would be opposed to putting so heavy a burden on the rural carriers, as recommended by the Postmaster-General, with no additional compensation or increase of salary. As it will be experimental, I thought it was best at first not to have a flat increase, but let the compensation rest on the fees received. I thought it better not to make a flat increase of so many hundred dollars a year, but rather provide that the receipts from the service, for the first year or two, be paid the rural carriers until the service was fully established. This will make the service self-sustaining while in its experimental stage. But, if after being tried, it was found to be self-sustaining, we can then give such a fixed increase of the salaries of carriers as may be warranted.

Mr. Overstreet insisted on the point of order, which was sustained.

The bill was then passed and sent to the Senate. The Senate Post Office Committee will give it consideration at once, and under a special order recently adopted, will give hearings, not only upon this measure, but upon the Burnham and Kean parcel post bills heretofore introduced. The Postmaster-General has prepared for an active campaign in the Senate by securing the printing on Senate resolutions of many thousand copies of the parcel post bills "for the use of the Post Office Department," together with a mass of literature on the subject compiled by the Department.

NEW YORK AND NEW JERSEY HARDWARE AND IRON ASSOCIATION.

THE New York and New Jersey Hardware and Iron Association, held its ninth annual banquet on Saturday evening, March 14, at the Hotel Knickerbocker, New York City. There was a large attendance of the members of the association, a number of representatives of manufacturers of vehicle materials being also present. The participants assembled in the reception room and spent some time before the dinner in renewing friendships and comparing notes on business conditions. The company took places at the table in the banquet room at 8 o'clock, and after being seated were photographed.

At the close of the repast, President P. C. Quackenbush, in the capacity of toastmaster, delivered a brief address of welcome, in which he touched upon the unusual prosperity of the larger part of 1907, referring also to the financial stringency marking the close of the year. He alluded to the value of the association in sustaining kindly feelings among the various branches of the Heavy Hardware trade during the latter period, and the maintenance of prices secured thereby. The suggestion was made by Mr. Quackenbush that at future annual meetings an instructive and entertaining feature might be the introduction of a Question Box, with a view to bringing up a discussion of live trade topics. He also counseled the maintenance of prices and cautioned members of the association not to believe all that customers said about competitors cutting prices.

E. R. Merrill of the E. R. Merrill Spring Company, was referred to as the "Dean of the Trade" by the president when he called upon him for remarks. In response Mr. Merrill congratulated the association upon its adherence to the ideas upon which the organization was founded, and complimented it upon the results achieved. M. Eisig, whose enjoyable papers have been a yearly feature of this assemblage, accompanied his regrets with verses appropriate to the occasion, which were read by William E. Kleine.

Instrumental and vocal selections, and a professional entertainer, one of whose points was, "When a man has a birthday he takes a day off, but when a woman has a birthday she takes two or three years off," added to the evening's enjoyment.

Among manufacturing and other interests represented at the banquet were the following: W. S. Comly, Russell, Burdsall & Ward Bolt & Nut Company; E. R. Merrill, John Merrill and W. C. Merrill, E. R. Merrill Spring Company; A. G. Matheasen, Lambertville Spoke Company; Dr. W. H. Pruden, New Jersey Plumbing Company; F. W. Wurster, Jr., F. W. Wurster Company; Charles A. Hauck, Hardware Board of Trade; L. B. Morris, Cambria Steel Company; F. F. Van Olinda, Paterson Tank Company; J. D. Keith, Phœnix Horseshoe Company, and F. E. Thompson of *The Iron Age*.

The officers of the association for the past year have been as follows: P. C. Quackenbush, president; Henry Bodevin, vice-president; George J. Hollereith, treasurer; R. H. Tiebout, secretary.

THE FURNACE BUSINESS AS AN ADJUNCT TO HARDWARE.

OUR readers have doubtless observed in the reports of proceedings of Hardware associations that quite a number of conventions were attended by Harvey J. Fueller, secretary of the Abram Cox Stove Company, Philadelphia, who delivered interesting addresses on features of the Hardware trade. A theme which received special consideration from him was the proper handling of furnace business by Hardware merchants. Mr. Fueller called attention to the fact that in many instances heating by means of warm air furnaces had been discredited either by the installation of furnaces of insufficient capacity or by defective workmanship in piping and other connections. He dealt convincingly on the opportunities offered to Hardware merchants for extending their business in this direction by adopting good methods of installation and avoiding the "evil demon of cheapness." The furnace business is one which is admirably suited to be taken up in connection with a Hardware store, as Hardware merchants in many cases operate tin shops and are thus in a position to handle easily this line of work. They should, however, thoroughly inform themselves as to the principles of warm air heating, and, further, should not hesitate to avail themselves of the opportunities now offered by leading furnace manufacturers, who give attention to the instruction of their customers regarding furnace setting, which will insure for the house owner good results in furnace heating. The company of which Mr. Fueller is an officer furnishes its customers with a manual or handbook which gives definite rules and explicit directions for properly installing a warm air heating and ventilating plant. Those who conduct this branch of their business on intelligent lines, avoiding the temptation to do competitive business on a cheap basis, will unquestionably find it profitable.

National Retail Hardware Convention.

THE complete programme for the convention of the National Retail Hardware Association, to be held at St. Louis March 24-27, inclusive, promises an interesting and profitable series of meetings. Morning and afternoon sessions will be held each day, the evenings being given over to entertainment features, which have been arranged with the co-operation of the local Hardware interests, including theater party, reception and banquet. The opening sessions will have the usual formal and congratulatory features, followed by the reports of officers and committees, which have served during the past year. Most of the meetings will be executive in character, but an open session of much interest will be held on the morning of the second day, when addresses are announced from C. W. Asbury, president of the American Hardware Manufacturers' Association; W. S. Wright, president of the National Hardware Association; E. C. Simmons and S. Norvell of St. Louis jobbing houses, and G. H. Maxwell, Chicago. At another session there will be a discussion by State secretaries, led by Frank A. Bare, Ohio, on the question, "What Assistance Can the National Render to Promote Association Work in Our Affiliated States?" There will also be an address on "The Business Man in Politics," by L. C. Abbott, Marshalltown, Iowa, who is well qualified to discuss the subject.

Lucas Bros., Davenport, Wash., have sold their Hardware business to Denson & Phillips.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

First Article.

BY JOHN L. SARDY.

VERY likely many people unfamiliar with Australasia think of Australia as an island in the South Pacific Ocean, instead of which it is a vast Continent, founded by England just when she had lost the American Colonies, and for a wonder acquired without use of the sword, which is more than can be said for other parts of the far-reaching British Empire, its area being approximately that of the United States proper. The people of New Zealand and Tasmania when contemplating a trip to Australia do not say "we are going to Australia," but "we are going to the mainland."

An Interesting Inventory.

Going back about 120 years the total number of Europeans on the Australian Continent was 1000, of whom over half were convicts. Considering its distance from other parts of the world the advancement made is creditable. Forty years after the colony was founded there was a flour famine, to-day there are millions of acres of wheat under cultivation, and that staple forms part of her exports. When the colony was founded there were 6 horses, 7 head of cattle, 29 sheep, 19 goats, 74 pigs and 5 rabbits. To-day the Commonwealth possesses 1,500,000 horses, over 1,000,000 pigs, nearly 8,000,000 cattle, about 66,000,000 sheep and more rabbits than there are stars.

Although Australia is per capita probably the largest importing country in the world, it is essentially an exporting country as well. The total yearly trade amounts to about £200,000,000, of which exports are over £110,000,000. Each State and the Dominion of New Zealand exports more than is imported.

The present Commonwealth of Australia consists of six States: Victoria, New South Wales, Queensland, South Australia, Western Australia and Tasmania. Leaving out the Island of Tasmania, the continent of Australia covers an area of about 3,000,000 square miles, big enough from point of area to be a continent, but not big enough from point of population for the good of the commonwealth.

A Population Problem.

Accerding to the latest Government statistics, the total population of the Commonwealth of Australia with New Zealand added was 4,939,223. Think of this vast stretch of productive land capable of sustaining many millions with not many more inhabitants than Greater New York and less than Greater London.

At a recent meeting of the Royal Society of New South Wales the retiring chairman of the engineering section of that body showed a diagram comparing the density of populations of Australia and her neighbors, which created almost a sensation. Japan, one-eighteenth the area of Australia, has 46,000,000 of people, increasing at the rate of 500,000 per annum. India, half the size of Australia, contains 300,000,000, the yearly increase being 1,000,000. China proper, a little less than one-half larger than Australia, contains 400,000,000 of inhabitants, increasing over 1,000,000 every year. The Island of Java, which is less than one-sixteenth the area of Australia, and lying just off the northern coast, has a population of 30,000,000, the increase being six times greater than Australia's.

Labor Hindrances.

According to the London Board of Trade, the total emigration from the United Kingdom to Australasia shows that prior to 1893 arrivals ranged from 44,055 in 1886 down to 16,183 in 1892, and from that date have never reached 16,000 per annum. The labor cry of "Australia for Australians," and a "White Australia," serves at least one purpose, and that is to retard increase of population, instead of fostering it, as should be done. Increased population means increased activity and increased activity means increased labor, not decreased wages; but the laborites do not see this. It is their idea to enhance the value of labor by making it scarce, instead of making a greater demand for labor by a greater community. Another thing is a lack of co-operation on the part of the various States. Each State has been working its own immigration scheme, independent of the Federal Government, notwithstanding pledges made when federation was in process to act in concert for the good of the Commonwealth. The Prime Minister of the Commonwealth has spoken plainly and to the point on this most important subject, urging the different States to act together and with the Commonwealth for the good of all concerned.

What would we think if each State in the Union were to act independently concerning immigration? Yet that is exactly what the Australian States are doing. Instead of helping each other as a concrete whole, they are rivals, one State trying to outdo the other in the endeavor to secure immigrants.

Jealousy Predominant.

The constitution of the Australian Commonwealth is largely patterned after our own, and will no doubt work out all right when the six States quit being jealous of one another. For instance, Sydney cannot get over the seat of the Federal Government being in Melbourne. When federation was carried out both cities struggled to become the Federal capitol, and a compromise was finally arrived at that some neutral place like our own District of Columbia should be selected, and in the meantime Melbourne should be the temporary capitol. That was seven years ago, and Melbourne has hung on like grim death ever since. Whenever New South Wales selects a neutral spot Victoria objects, and when Victoria picks out a place New South Wales won't have it.

Another instance of lack of co-operation is this: All the States in the Commonwealth are connected by rail except Western Australia. The railroads are owned and operated by the Government, and Western Australia naturally enough wants the lines extended connecting the State, but Queensland, situated on the extreme other side of the continent, contends it would be unfair to ask her to help pay the cost, losing sight of the fact that the desired extension of the line would work out for the benefit of all concerned. Though a commonwealth in name, sectional feeling exists to such an extent that things are done which are not good for the commonwealth of the people.

(To be continued.)

Rhode Island Hardware Association.

THE annual meeting of the Rhode Island Hardware Dealers' Association was held on the 3d inst., at the Narragansett Hotel, Providence. A banquet at 7 p.m. preceded the meeting, which was called to order an hour and a half later. The meeting was well attended, and there was considerable discussion of matters of interest to the members. The officers elected for the ensuing year are as follows: President, Charles W. Aspinwall, Aspinwall Hardware Company, Providence; vice-president, John McGlinchey, Olneyville; secretary, John R. Bemis, Thompson Hardware & Chandelier Company, Providence; treasurer, William B. Ayer, Belcher & Loomis Hardware Company, Providence. The following members of the Executive Committee were chosen in addition to the officers: F. T. Kelley, Barker, Chadsey & Co., Providence; William K. Toole, Pawtucket; Charles E. Dudley, Union Hardware & Electrical Supply Company, Providence.

AT the recent annual meeting of Benedict Mfg. Company, East Syracuse, N. Y., the following officers and directors were elected: Harry L. Benedict, president; George N. Crouse, first vice-president; C. C. Graham, second vice-president; Charles Van Wagner, secretary; John Bailey, assistant secretary; R. B. Rontree, treasurer, and Newton Owen, assistant treasurer. The directors elected were George N. Crouse, Charles Van Wagner and Harry L. Benedict. Reports showed the business of the company to be in a most satisfactory condition. Dividends were declared on both the preferred and common stock, 7 per cent. on the former and 6 per cent. on the latter.

New England Hardware Dealers' Association.

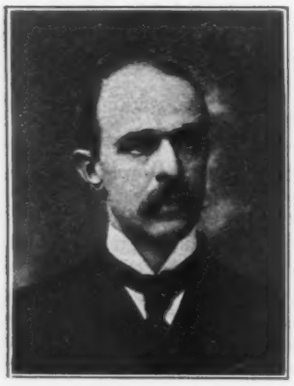
THE New England Hardware Dealers' Association held its annual convention at the Hotel Vendome, Boston, March 11 and 12. There was a large and representative attendance from all over the New England States that are prominently identified with the association, Connecticut being less fully represented because of the existence of its own association. Great interest was shown in the various questions that are affecting the Hardware trade, though there was no lengthy formal discussion of these topics. The ladies' night dinner was the usual success. The year has shown a slight increase in membership and a decided increase in financial strength. The meeting opened Wednesday afternoon with President F. Alexander Chandler in the chair. This session was a short one. Secretary Charles L. Underhill read a number of communications and the president named convention committees, as follows:

NOMINATIONS: J. B. Hunter, Boston; M. A. Chandler, Boston; Franklin K. Brown, Boston.

RESOLUTIONS: George A. Fiel, Waltham; Frank E. Peirson, Pittsfield; Bion C. Pierce, Taunton.

REVISION OF BY-LAWS: S. H. Thompson, Lowell; G. C. Winter, Southbridge; A. Lubbe, Cambridge.

Many of the members then attended a hearing before the Committee on Federal Relations of the Massachusetts Legislature on a resolution endorsing the parcel post legislation as proposed by Postmaster-General Meyer. The committee room at the State House was filled with Hardware merchants, nearly 40 in number, as well as representatives of the Retail Grocers' and Retail Druggists' Association. The speakers in opposition to the resolutions included President Chandler and D. Fletcher Barber of the New England Association, and A. H. Abbe, New Britain, Conn., the latter representing the National Association at the Boston convention.



S. H. THOMPSON.

F. E. PEIRSON.

D. F. BARBER.

H. M. SANDERS.

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At the Thursday morning session the Committee on Resolutions, through its chairman, Mr. Fiel, reported resolutions indorsing the Appalachian and White Mountain forest reserves, and the general plan of inland waterways, which were carried.

Officers Elected.

The report of the Committee on Nominations resulted in the election of the following officers:

PRESIDENT, S. H. Thompson, Lowell, Mass.
FIRST VICE-PRESIDENT, Frank E. Peirson, Pittsfield, Mass.
SECOND VICE-PRESIDENT, D. Fletcher Barber, Boston.
SECRETARY, Charles L. Underhill, Somerville, Mass.
TREASURER, Henry M. Sanders, Boston.
DELEGATES TO NATIONAL CONVENTION: D. Fletcher Barber, Boston; Ernest L. Davis, Boston; Frank E. Peirson, Pittsfield, Mass.
DIRECTORS: Ernest L. Davis, Boston; Bion C. Pierce, Taunton; S. E. Pope, Jeffersonville, Vt.; James De F. Phelps, Windsor Locks, Conn.; H. P. King, Portland, Me.; J. F. Willets, Roxbury, Mass.; W. H. Underwood, Manchester, N. H.; Austin W. Whitcomb, Beverly, Mass.; W. H. Sawyer, Providence, R. I.; Elwood Adams, Worcester, Mass.; Joseph H. Williams, Boston; H. L. Russell, Holyoke, Mass.

The Board of Directors now consists of 17 persons, including the officers, the association having voted to increase the number from 11, as formerly.

A vote of thanks was extended President Chandler for his efficient services during the year.

Report of the Secretary.

Secretary Charles L. Underhill's annual report was as follows in part:

Did you ever think what an influence our association would have if every Hardware merchant in New England took a personal interest in its growth, and responded to the requests of its officers? The National Association with which we are affiliated now numbers over 12,000. The New England Association has less than 200; Connecticut, 75, and western Massachusetts Association about 25 members. In contrast, Illinois and Ohio have over 1000; Indiana, Minnesota and Wisconsin about 800; Nebraska, 500; North and South Dakota about the same; and the other 27 State associations are constantly adding to their lists of members.

To make our association complete and give the greatest good to all we should have on our membership list the name of every Hardware merchant in Maine, New Hampshire, Vermont, Rhode Island and Massachusetts. It actually pays in dollars and cents, and every dealer who is not a member should be ashamed to reap the benefits and refuse to stand his share of the expense and labor.

Association Achievements.

A few of the recent benefits have been:

1. Over 200 manufacturers and jobbers have agreed to confine their sales to legitimate channels, and are doing so.

2. Since October 1 the railroads have forbidden the posting of big advertising placards on freight cars and making billboards of them.

3. Railroad agents are not allowed to deliver catalogues, and in several States are not permitted to solicit business for any firm.

4. Over 5000 Hardware dealers are saving from 30 to 50 per cent. on their fire insurance and all our members have that privilege.

5. In Massachusetts a bill to license dealers in Firearms and subject them to a fee of $50 was defeated in the Legislature, largely through association work.

These and many other benefits have been brought about through the combined efforts of the national and the various State associations, and the membership of every Hardware dealer we secure aids just that much more in accomplishing these results, to say nothing of the friendships formed, business acquaintances extended, the co-operation and organization which broadens the mind, establishes confidence and makes for the prosperity and happiness of all.

Activity of Members.

Your Executive Committee has held several meetings, and your officers many conferences during the year, but the success of every organization depends upon its members. Be an active member, talk Hardware association all you can and aid yourself and your fellow tradesmen, for the larger the number the stronger the organization and the more good it can accomplish.

As I said before, our association now numbers about 200. If that number can be increased to 300 I would suggest that our custom of giving the members a dinner every year be discontinued, and the corresponding secretary be paid a sufficient salary to enable him to look out for the interests of the association and keep in close touch with its members. Many members think the banquet or other entertainment is all there is to it, and too much stress has been laid upon the social side. If all could be induced to hold office in the association for one year those who say, "It is of no benefit to me," would have a very different opinion before serving one month.

F. A. CHANDLER.

With a little personal effort on the part of all our members we can easily add 200 to our list before our next convention.

Treasurer Henry M. Sanders made his report, showing the largest balance in the history of the association.

Question Box.

On Thursday afternoon the Question Box discussion was opened, with A. H. Abbe as chairman, the following questions having been submitted:

1. Is it wise to hold for a large margin on staples?
2. Does the carrying of mutual insurance jeopardize our interests with stock company insurance?
3. Is it time for the formation of a New England Hardware Mutual Fire Insurance Company?
4. Can a business man afford to enter the political field?
5. Are the dead beats and slow pays growing less?
6. What can we afford to do to best train our sales people?
7. Should price regulation be a feature of association work?
8. Should we encourage the manufacturer of patented specialties to establish a uniform retail price?
9. When is a jobber or manufacturer justified in selling outside of regular trade channels?
10. Does good buying depend most upon prices or upon selection and quality?
11. What kind of advertising by manufacturers helps the retail dealer?
12. Are we drifting toward a cash basis?

J. B. Hunter stated that in his experience the dead beat has been growing less numerous. The Hardware merchant has had a good deal of experience with this class of customer and has learned the lesson, until he is more particular in his accommodations, looks up credits more carefully and watches book accounts.

Secretary Underhill, in speaking on the question, Can a Hardwareman afford to enter the political field? stated that in his own experience he has found his political activity a profitable one in his own business, through friendships made and by the bringing of people to his store.

Hardware Mutual Insurance.

W. P. Lewis, Huntington, Pa., secretary of the Hardware Mutual Fire Association of Pennsylvania, and the National Hardware Mutual Fire Insurance Company, read an interesting paper on the subject of mutual fire insurance. In the course of his answers to questions he made announcement that the directors of the Pennsylvania Company had voted to increase its limit of insurance from $3000 to $5000.

After some general discussion of the advisability of establishing a New England Hardware Mutual, it was voted that a committee of three be appointed to make a general investigation of the subject, and report to the association at next year's convention. President Chandler appointed A. H. Abbe, Charles L. Underhill and H. L. Russell.

Other Addresses.

J. A. Welch, Globe Mfg. Company, Taunton, Mass., addressed the meeting, extending the greetings of the American Hardware Manufacturers' Association.

Charles H. Jones of the Commonwealth Shoe & Leather Company, Boston, took the place of Louis D. Brandeis, who was to have made an address on the situation relating to the merger of the Boston & Maine and

the New York, New Haven & Hartford railroads. Mr. Jones followed the same line of argument as that which Mr. Brandeis has been making in his campaign against the merger. As many of those present would be personally affected by the consolidation the address was listened to with unusual intentness. Representative Norman H. White and George L. Barnes, secretary of the Massachusetts Anti-Merger League, spoke along the same lines.

A. H. Abbe, representing the National Retail Hardware Association, as a member of the administrative council, discussed various matters of interest. He also presented a resolution protesting against the passage of a domestic parcel post bill, which was adopted.

Next Meeting at Springfield.

It was decided to hold the 1909 convention at Springfield, Mass., possibly a little later in the year, that advantage may be taken of the spring weather in seeing the country round about the city. The change from Boston establishes a new precedent of visiting the various important centers, instead of confining the convention place to one locality.

The annual banquet was held Thursday evening at the Vendome. It was ladies' night, many of the members being accompanied by their wives. President Chandler was the toastmaster. The speakers were Albert E. Winship of the Massachusetts State Board of Education, who took for his subject the influence of New England colleges on industrial life; Representative Robert Luce, Somerville Mass.; Rev. Charles A. Bidwell, Waverly, Mass.; Hon. Louis A. Frothingham, Boston, and Representative Robert M. Washburn, Worcester,

Hardware Exhibits.

The exhibit of manufacturers' products was not so large as last year on the occasion of the joint conventions of the National and New England associations, but it was none the less interesting. Following is a list of the manufacturers represented:

STANLEY WORKS, New Britain: Wrought Steel Butts and Hinges. W. E. Stevens, G. B. A. Baker.
HART & COOLEY COMPANY, New Britain: Wrought Steel Registers and Lockers.
RUSSELL & ERWIN MFG. COMPANY, New Britain: Builders' Hardware. A. H. Bowman.
GLOBE OPTICAL COMPANY, Boston: Optical Goods. W. E. Munday, R. F. Elie.
A. R. MITCHELL, 24 Beach street, Boston: Ratchet Screwdriver.
CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Materials. H. H. Miller, H. W. Tobey.
AMERICAN STEEL & WIRE COMPANY, New York: Fencing. L. A. Dietrich, J. G. Fletcher, C. L. Tite.
STRATTON LEVEL COMPANY, Greenfield, Mass.: Levels. A. L. Richtmyre, F. W. Proctor.
H. H. MAYHEW COMPANY, Shelburne Falls, Mass.: Mechanics' Tools. A. L. Richtmyre, F. W. Proctor.
PIKE MFG. COMPANY, Pike, N. H.: Sharpening Stones. H. E. Smith, H. W. Busier.
F. M. TRAFTON COMPANY, Boston: Metal Polish.
MALLEABLE IRON FITTINGS COMPANY, Bransford, Conn.
E. & G. BROOKE IRON COMPANY, Birdsboro, Pa.
J. W. HOFFMAN COMPANY, Boston: Paints. A. K. Woodward.
F. W. BIRD & SON, East Walpole, Mass.: Paroid and Neponset Waterproof Building Paper. J. C. Donnelly.
SHERWOOD METAL WORKING COMPANY, Syracuse, N. Y.: Adjustable Metal Frame Window Screens. J. E. Sherwood.
PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Prisco Lanterns, Boilers and Dinner Pails. A. J. Breede.
WADSWORTH, HOWLAND & CO., Boston: Paints. A. P. Felton, R. H. Russell.
LEE CHAIR COMPANY, Oneida, N. Y.: Reliance Mop Wringer. M. E. Davis.

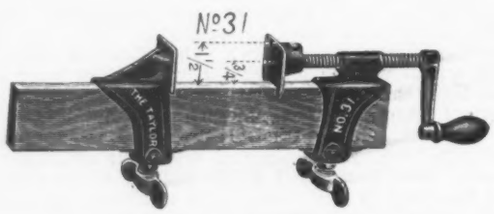
THE general tendency of Wire Rope to untwist when hoisting buckets and other similar loads from deep shafts, such as mines, is well known, and has been the subject of much careful investigation on the part of manufacturers seeking to discover the cause and provide a remedy. This tendency is so pronounced that when being lifted from a great depth the load is sometimes scattered by being spun rapidly around. After considerable research and continued experiment a process of laying the rope together in such a manner that it will not untwist, regardless of the length of rope suspended in a shaft, has been discovered by Olaf Tangring, wire expert of the American Steel & Wire Company. A patent covering this process has just been granted Mr. Tangring by the Patent Office.

Rock Island Hinged Pipe Vise.

The Rock Island Tool Company, Rock Island, Ill., New York office 136 Liberty street, has just put on the market the Rock Island hinged pipe vise and a similar vise of self-locking type. The hinged vise is made in Nos. 110, 111 and 112, the capacities of which are ⅛ to 2½, ¼ to 3½ and ½ to 4½ in. pipe. The body and base are malleable, screw and handle cold rolled steel and jaws of crucible tool steel. The self-locking type is made of the same material, in the same way, with identically the same capacities and prices, but the base has lugs on both sides, so that a strong latch pivoted to the upper part may hang on either side for greater convenience by simply reversing the position of the upper portion.

Taylor Clamp Heads No. 31.

The James L. Taylor Mfg. Company, Bloomfield, N. J., is putting on the market clamp heads, as shown in the accompanying illustration. They are designed for cabinet and light sash and door work, and are also handy for holding a joint after it has been made and the glue squeezed out by a heavier clamp. The castings are of refined malleable iron, and the clamps are constructed to give greatest strength with least weight. It is explained



Taylor Clamp Heads, No. 31.

that there is no tendency to slip, for the head holding set screw and serrated shoe, which is fastened in, is set forward and grips permanently without injuring the bar. A turn of the screw is sufficient to tighten or release the grip, a crank being used as the quickest and easiest method of turning. The clamps are designed for use on 2¼-⅞ in. wooden bars, which need only be ripped off with a saw. They require no special preparation, and may be used in any desired length.

The Brown Fireproof All Steel Window Sash.

The Brown Hoisting Machinery Company, Cleveland, Ohio, originally made the all steel window sash shown

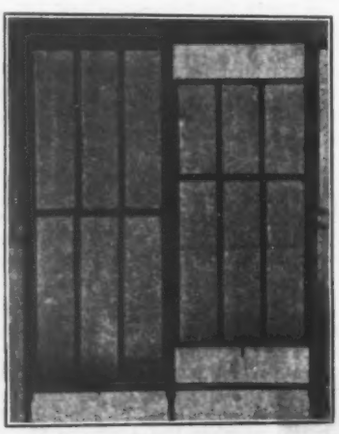


Fig. 1.—The Brown Double Hung All Steel Window Sash.

in Figs. 1 and 2 for its own shops, erected about six years ago. The sash has, however, received so much favorable

comment that the company has decided to market it regularly. The sash is made of a small channel frame, on the inside of which are fastened small angles. The angles are set in the frame and are used for holding the glass. Besides this use, they tend very much to stiffen the channel frame. The angles on one side of the glass are riveted to the channel frame, while on the other side

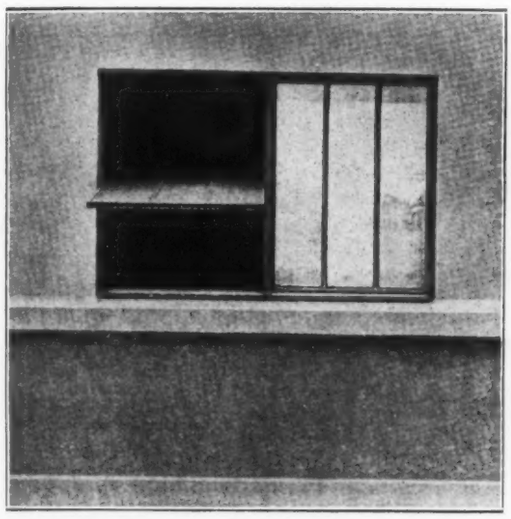


Fig. 2.—The Brown Pivoted All Steel Window Sash.

they are bolted and screwed to the frame, so that the glass can be easily removed by simply unbolting the angles. In a sash where there is more than one light the angles between the lights are fastened together by means of muntin bars. The company explains that this type of sash is extremely strong, neat and attractive in appearance, and that the metal used, with its proper distribution with respect to center of gravity, makes it a very satisfactory fireproof construction. The company recently made an interesting test of the sash. The lights were ¼-in. Mississippi wire glass. The outside dimensions of the sash were 3 ft. 7¾ in. x 4 ft. 8⅛ in. On account of the conditions some difficulty was experienced in getting the temperature desired, but in the course of about six hours a temperature of over 1200 degrees was

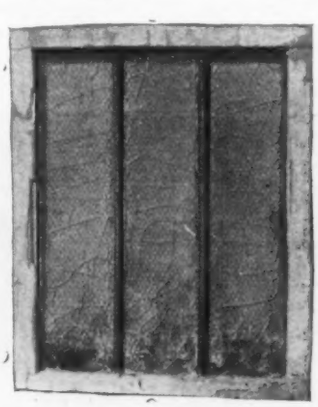


Fig. 3.—Condition of Sash After Fire Test.

obtained. The glass was badly bowed inward and cracked, as shown in Fig. 3, but the sash was not in the least affected. When the above temperature was obtained, the blast was turned off and water was turned on to the glass through a 2½-in hose under full city pressure. This resulted in breaking the glass in some places, but the sash remained unaffected.

Shoe Scraper and Cleaner.

The Stiles Foundry & Supply Company, Parkersburg, W. Va., is putting on the market the device for scraping and cleaning shoes shown in the accompanying illustration. It is made of cast iron and is nicely painted. On either side of the top are two brushes, and on the bottom is a scraper. As the shoe is pushed back and forth

Shoe Scraper and Cleaner.

between the brushes it cleans all sides at once. It also has a scraper between two of the knobs at the top for removing the dirt that collects between the heel and the instep, in this manner cleaning the shoe perfectly on all parts. The weight of the cleaners is 17 lb. each, so that they will stay in position, even if used by heavyweights. The brushes are detachable, and can be replaced very easily when necessary. They may be expected to last, however, for a considerable period.

Ford's Double Quick Auger Bit.

The Ford Auger Bit Company, Holyoke, Mass., placed on the market several months ago an extremely fast cutting bit, which is shown in the accompanying illustration. It has two extension lips and spurs, combined with Ford's patented concave twist, which the company guarantees not to clog when boring any kind of wood, while it cuts easily enough for the hardest oak or ash, and very smoothly. The bit was first made in 10-16th and 11-16th sizes only, for the use of electricians, but it was so successful in filling a demand for such a tool that the company now manufactures all sizes, from 4-16 to 16-16ths. It is remarked that the bit, besides being a great time saver for electrical work, is well adapted to putting in door locks, &c.

Ford's Double Quick Auger Bit.

Weldarine.

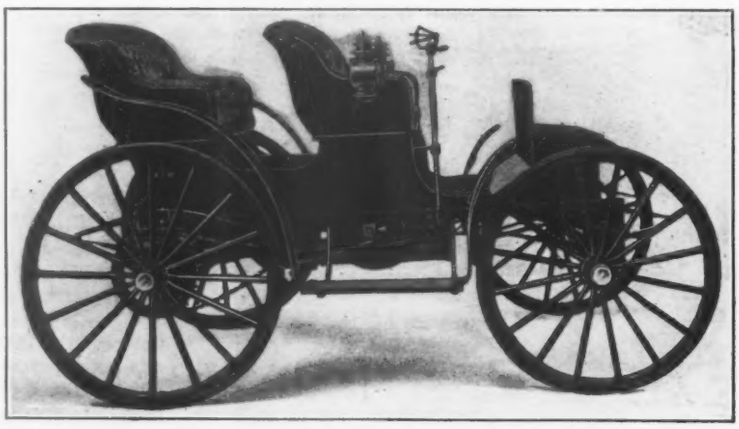
The Weldarine Agency Company, D. S. Morgan Building, Buffalo, N. Y., is offering a preparation under the name of "Weldarine," for welding broken castings. It will not only make a strong joint in brazing cast iron, but will braze cast iron to steel and steel to semisteel. It is claimed that with this preparation every machinist, blacksmith and metal worker can satisfactorily braze cracked automobile cylinders, broken typewriter frames, heavy vises and other large or small castings at a cost of from 50 cents to $10.

Arcade Roller Skate Wheels.

The Arcade Mfg. Company, Freeport, Ill., is manufacturing iron roller skate wheels in large quantities, the demand having largely increased with the renewed popularity of roller skating. The wheels are referred to as of the finest quality and made of the best grade of gray iron.

Road King Gasoline Car.

The Model D Road King, manufactured by the Monarch Machine Company, Des Moines, Iowa; and illustrated herewith, is described as a utility car. It is the outgrowth of a demand for a low priced machine for general service and is designed to be operated with a minimum maintenance expense. The tires, being of hard rubber, are not subject to disablement by puncture, and its mechanism throughout is designed for durable service. Motive power is furnished by a two-cylinder, double opposed, four-cycle gasoline engine, of from 16 to 20 hp. The inlet and exhaust valves are inclosed in cages in the cylinder head. The engine is water cooled, the water being circulated by a gear pump with direct drive. Ignition is furnished by a jump spark from dry batteries. A mechanical oiler furnishes lubrication for the engine and hard oil cups are fitted on the countershaft. Both high and low speeds are controlled by a hand lever at the right of the driver and the reverse is operated by a foot lever, as are also the brakes. The car is rated at a speed capacity of 30 miles an hour on high gear. Wheels are 40 x 40 in. in diameter, with a wheel base of 84 in. and thread of 56 in. All wheels are equipped with roller bearings, and four full elliptic springs support the body anr relieve the jolts. The steering gear is controlled by a lever or wheel, as desired. The gasoline tank has a storage capacity of 9 gal. and the car complete weighs 1500 lb.



Road King Gasoline Car, Model D.

Howland Pump Oiler.

The Maple City Mfg. Company, Monmouth, Ill., has added to its line of oilers one of new design, as shown in the accompanying illustrations. This is known as the Howland pump oiler, and differs from oilers of the same character heretofore made by the company in that the pump is located inside the can body, where it is constantly submerged in oil. The advantages claimed for this design are that the pump cannot lose its priming and is protected from dents and injuries incident to rough usage. The can has a detachable spout, the connection being made by a union nut with a leather gasket, which makes a tight fitting joint. The pump plunger, as will be noted in Fig. 2, is located just above the handle in a position for convenient operation. The cans are made of drawn steel, with double seamed and soldered bottoms. For overhead oiling, spouts up to 10 ft. long can be supplied, and it is claimed that oil can be pumped when it is so cold it will not run out of a common can.

Fig. 1.—Howland Pump Oiler, Spout Detached.

Fig. 2.—Pump Oiler in Overhead Operation.

Machinists' Portable Tool Case.

C. E. Jennings & Co., 42 Murray street, New York, has just added to an already large line of tool chests the Machinists' Tool Case, No. 75, here illustrated. Fig. 1 shows it closed, ready to carry, the front pulled down as in a sectional bookcase, and fastened with a Yale pattern chest lock in center of bottom strip. Fig. 2 is a reproduction of the case with lid raised and recessed at right angles over the drawers. The chest is made of chestnut, natural finish, protected at every corner with ornamental brass parts, has a leather slip handle with brass mountings, and is designed not only for convenience in carrying about, but as a handy place for tools, which can easily be kept locked by the owner. The outer dimensions are: length, 19 in.; width, 9 in., and hight, 11⅛ in. All drawers are 17 in. long and 6¾ in. wide, the upper three having a uniform depth of 1 in. and the lower drawer 3⅛ in. clear. At the bottom is a secret compartment 1⅜ in. deep, reached by taking out the lower drawer, designed for the safe keeping of sketches, drawings, blue prints or valuable papers of kindred character. The drawer fronts are recessed and brass trimmed. In original packages the cases are crated in fours. A similar tool case, specifically adapted to the use of autoists, to be carried in the car, is about ready for the market.

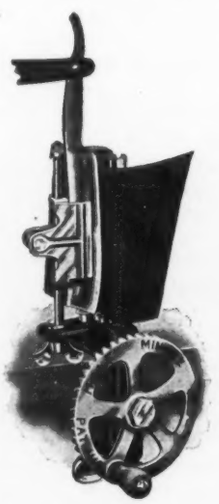
Fig. 1.—Machinists' Portable Tool Case, Closed.

Fig. 2.—Portable Tool Case, Open.

Boeke & Raymer, Lena, Ill., have succeeded Boeke & Altenbern, and will continue the business in Shelf and Heavy Hardware, Stoves, Tinware, &c.

Half-Minute Razor Edger.

The Half-Minute Edger Company, 320 Broadway, New York, has put on the market the Half-Minute razor edger here illustrated. Its purpose is to strop any kind of a razor, standard or safety, wafer or concaved blade. The blade of whatsoever kind is held rigidly in position by means of a rubber covered clamp 1½ in. high, which has a stout steel spiral spring at back of clamp, which by pressure permits insertion of blade. The cutting edge should project beyond this clamp about ¼ in., and for adjustment to accommodate the many widths of blades there is a travel of about ⅜ in. inward or outward of the vertical spindle 3-16 x 4 in. over all, which is fastened at any desired position by a thumb screw. This need be changed only for varying widths of blade. The two flexible stropping leathers are fastened at one side and free at the other, laterally, 3 in. from top to bottom and biased so that the width of 3⅛-in. tapers to 2 in. The leathers are of the same dimensions, but the bias on one is the opposite of the other, so that in operation there is a diagonal or sweeping motion which imparts to a razor blade a better cutting edge, but which for the novice in free hand stropping is difficult to acquire. The body of the edger is an iron frame, maroon finish, with polished and nickeled working parts, its outer dimensions being 7 in. top to bottom. It can be fastened to table, shelf, &c., up to a thickness of 1⅜ in. The geared flywheel 3 in. in diameter meshes at the bottom with a ⅞-in. diameter gear wheel, which in turn revolves the 5-32 in. vertical spindle, to which one of the stropping leathers is fastened. The other stropping leather, similarly mounted, is turned in the opposite direction by the gear of first spindle, so that both edges of the blade are simultaneously stropped outwardly. The directions given for stropping are to turn the wheel rapidly about 40 times and then slow down to 20 or 30 final strokes to produce an excellent cutting edge. A cog shield at the bottom prevents any contact of razor blade with the spindle gears. The edger is put up singly in a neat dovetailed slide cover wood box 7⅜ x 3¼ x 3⅛ in.



Half-Minute Razor Blade Edger.

Cast Iron Spout Cut-Off.

The new cast iron rain spout cut-off, shown in the following illustration, is a recent production of the Perfection Cut-Off Company, 1503 Glendale avenue, Peoria, Ill. It is claimed for this cut-off that, being cast in one solid piece without joints, it is practically indestructible. The cut-off valve is also of cast metal, made in one piece, and is operated by a malleable cast iron handle firmly secured to it. These cut-offs are made to fit the ordinary sizes of spout, which are easily attached and secured without cutting or fitting. No soldering is necessary, there being two holes at the top and four at the bottom of the cut-off into which small rivets or nails are driven to secure the pipe. In order to determine the effect of freezing when full of water upon this cut-off, tests were conducted through two entire winters, which are said by the company to have resulted in no breaks, although at times the device was solidly filled with ice. These cut-offs are made in two sizes, 3 and 4 in.

Cast Iron Cut-off.

T. D. W. MOORE has become general manager of the Savage Arms Company, Utica, N. Y., succeeding W. J. Green, who continues vice-president of the company. Mr. Moore has long been identified with the Firearms business, starting with Hartley & Graham 27 years ago and having for the past three years been associated in an executive capacity with the Remington Arms Company. Within the past few months the capital stock of the Savage Arms Company has been increased, and arrangements have been made whereby a new automatic Pistol will soon be added to the line of Arms now being made.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—	℔ gal.
Linseed, State and Western, raw, in bbls	.41 @42
City, Boiled, in bbls	.44 @45
City, Raw, in bbls	.43 @44
Raw, Calcutta, in bbls	.70 @..
Lard, Prime, Winter	.65 @70
Extra No. 1	.55 @57
No. 1	.47 @52
Cotton-seed, Crude, f.o.b. mill	.28½@29
Summer Yellow, prime	.37½@38
Summer White	.40 @40¼
Yellow Winter	.40½@40¾
Tallow, Prime	.58 @60
Menhaden, Brown, Strained	.41 @42
Light Strained	.41 @42
Northern	@..
Southern	.37 @..
Cocoanut, Ceylon	℔ 6½@ 7
Cochin	℔ 7¾@ 8
Cod, Domestic, Prime	.42 @44
Newfoundland	.44 @46
Red, Elaine	.39 @40
Saponified	℔ 5⅝@ 5½
Olive, Yellow	.67 @69
Neatsfoot, Prime	.55 @58
Palm, Lagos	℔ 6 @ 6¼

Mineral Oils—	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	.13½@14
Summer	.12½@13
Cylinder, light, filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	.14½@15
903 sp. gravity	.13½@14
983 sp. gravity	.11 @11½
Red	.13½@14

Miscellaneous—		
Barytes:		
White, Foreign	℔ ton	$18.50@20.50
Amer. floated	℔ ton	19.00@20.00
Off color	℔ ton	13.00@16.50
Chalk, in bulk	℔ ton	3.00@ 3.40
China Clay, Imported	℔ ton	11.50@18.00
Cobalt, Oxide	℔ 100 lb	1.45@ 2.60
Whiting, Commercial	℔ 100 lb	.42@ .52
Gilders	℔ 100 lb	.55@ .60
Ex. Gilders	℔ 100 lb	.60@ .65

Putty, Commercial—	℔ 100 lb
In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—	℔ gal.
In Oil bbls	.52½@..
In machine bbls	.53 @..

Glue—	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—	℔ lb
Bleached, Commercial	.23 @24
Bone Dry	.29 @30
Button	.40 @50
Diamond I	.47 @48
Fine Orange	.30 @35
A. C. Garnet	.27 @28
G. A. L	.20 @22
Kala Button	.18 @20
D. C	.49 @50
Octagon B	.38 @40
T. N	.23 @24
V. S. O	.47 @48

Colors in Oil—	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—	℔ lb
Lead, English white, in Oil	.10⅛@10⅝
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7¼
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8¾
Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	℔ lb

Zinc, Dry—	
American, dry	5⅛@ 5⅝
(French process), Red Seal	6¾@ 7
(French process), Green Seal	7¼@ 7½
German (French process), Red Seal	6⅝@ 7
Green Seal	7¼@ 7⅝
White Seal	7⅝@ 8¼
French, Red Seal	8¼@ 8¾
Green Seal	10½@10¾

Dry Colors—	℔ lb
Black, Carbon	.6½@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.31 @33
Blue, Prussian	.29 @31
Blue, Ultramarine	.3½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs.	@ 6¾
Litharge, bbls., ½ bbls., kegs.	@ 6¾
Ocher, American	℔ ton $8.50@16.00
American Golden	.2½@ 3¼
French	.1¼@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @11
French	.12¾@13
German	.10 @11
American	.8½@ 8¾
Red, Indian, English	.4½@ 6
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1½@ 2
American Burnt and Pow'd.	.1½@ 2
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .90@ 1.00
English	℔ 100 lb .80@ 1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, T'key. Bnt. & Pow.	.2¾@ 3
Turkey, Raw and Powdered	.2¾@ 3
Burnt, American	.1¼@ 2
Raw, American	.1¼@ 2
Yellow Chrome, Pure	.13 @15
Vermilion, American Lead	.7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@66
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives'. Patent....35%
Taplin's Perfection....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs ....$2.00@$3.00

Anvils—American—
Eagle Anvils....℔ lb @8½¢
Hay-Budden, Wrought....9½@9¾¢
Trenton ....℔ lb 9½@9¾¢

Imported—
Swedish Solid Steel Sisco, Superior, ℔ lb....10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—
Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co....10%

Augers and Bits—
Com. Double Spur....75&10@80%
Jennings' Pats., Bright,65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ℔ doz. $28; No. 2, $18....60&10%
Ford's, Clark's Pattern....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$6.50@7.00
Ames ....25&10%
Universal 20%

Ship Augers and Bits—
Ship Augers....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—
See *Grease, Axle*

Axles—Iron or Steel
Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14....65@65&10%
Nos. 15 to 18....70@70&10%
Nos. 19 to 22....70@70&10%

Boxes, Axle—
Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent....lb., 9½@10¢

Bait—Fishing—
Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—
Caldwell new list....50%
Pullman ....50&10@60%

Spring—
Spring Balances....50&10@60%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb.... per lb., —@2½@2¾¢

Towel—
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Ecale Beams....40%
Chattillon's No. 1....30%
Chattillon's No. 2....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned....℔ doz. $1.50

Beaters, Egg—
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover....$6.50

Bellows—
Blacksmith, Standard List..
Split Leather....60&10@65%
Grain Leather....50@50&10%

Hand—
Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—
Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Net Prices.

Bells—Cow—
Ordinary Goods...75&5@75&10&5%
High grade....70&10@75%
Jersey ....75&10%
Texas Star....50%

Door—Hand—
Home, R. & E. Mfg. Co.'s....55&10%

Polished, Brass....50&10@60%
White Metal....50&10@50&10&5%
Nickel Plated....50&5%
Swiss ....50&5%
Coue's Globe Hand Bells....33⅓@35%

Miscellaneous—
Farm Bells....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—
Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard ....70&5%
Light Standard....75%
Cut Leather Lacing....40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard ....70@70&5%
Extra ....60&5@60&10%
High Grade....50&5@50&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes....50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—
Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined....40%
Embossed 50%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co....83⅓%

Bolts—

Carriage, Machine, &c.—
Common Carriage (cut thread):
⅝ × 6 and smaller....75@—%
Larger and longer....70@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends....70@—%
Machine (Cut Thread):
⅝ × 4 and smaller...75&5@—%
Larger and longer....70@—%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:
Inch	*6*	*8*	*10*
Per doz..	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:
Inch....	*6*	*8*	*10*
Per doz..	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch....	*6*	*8*	*10*
Per doz..	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed....60&10%
Spring ....70&10@70&10&10%
Shutter ....50&5@50&10&5%
Square Neck....75@75&10%
Square ....70&10&10%
Ives' Patent Door....55%
Ives' Wrought Metal....45%

Expansion—
Richards Mfg. Co....50&10%
Steward & Romaine Mfg. Co.
Style No. 13, Double....55%
Style No. 1, Single....55%
Style No. 100, Dbl. Jaw, Single..50%
Lag Screw....66⅔%

Plow and Stove—
Plow ....65&5@70%
Stove ....85@85&5%

Tire—
Common Iron....80%
Norway Iron....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99....80%
Norway Phila., list Oct., '84....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:
Inch....	*1¼*	*1½*	*1¾*	*2*
Per doz....	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz....	*$8.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—
C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—
Common Ball, American....$1.50
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 70 to 120, 81 to 123, 297 to 414....60%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—
Wrought Steel....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Taplin Victor Handy Egg Beater Bracket ....℔ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—
M'f'gr's list, price per gross.

	Quart..	*10*	*12*	*14*	
Water, Reg...	*25.35*	*28.00*	*32.00*		10&5%
Water, Hvy...	*45.35*	*48.00*	*52.00*		
Fire, Rd. Btm.	*32.00*	*34.65*	*38.65*		
Well	*37.35*	*41.35*	*45.35*		

Bull Rings—See *Rings, Bull*

Butts—Brass—
Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's....45%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5
Parliament Butts....70@70&5

Wrought Steel—
Bright.
Light Narrow, Light Reversible ....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c....70%
Back Flaps, Table Chest..65% Japanned.
Light Narrow, Loose Pin, 40&5&
Light Narrow, Ball Tip..60%
Broad ....40&5%
Steeple Tipped....70%
Ball Tipped....70%

Extra 10—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....*per M* 34@35¢
F. L.....*per M* 40@42¢
G. E.....*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem.....20%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	7-16	½	9-16
$8.65	6.05	4.90	4.25	4.15	4.10
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.		
$4.05	3.95	3.90	4.00		

In cask lots, deduct 25¢.

German Coil.....60@60&5%
German Pattern Coil:
6-0 to 1.....70&5@70&10%
2 and 3..60&10&10@60&10&10&5%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, *Straight, with ring*..$28.00
6¼—6-2, *Straight, with ring*..$29.00
6½—8-2, *Straight, with ring*..$32.00
6½—10-2, *Straight, with ring*..$37.00

NOTE.—Add 2c per pair for Hooks Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c..60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....60%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....lb., 4½@5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@10%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain..... 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft..... $1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45@50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....25%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—

Socket Framing and Firmer

Standard List.....80@—%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No, 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's .....66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold— *lb.*

Cold Chisels, good quality..15@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....20%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 83 and 84 .....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72 .....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%
Whitaker Mfg. Co.:
National Drill.....25%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co. .....50&10%
Besly, Parallel.....33⅓&10%
Myers' Hay Rack.....45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each..... $8.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 25%

Clips, Axle—

Regular Styles, list July 1, '05, 80&10&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Ribbs, Globe, Kerosene, Racking, Liquor, Bottling, &c......70@—%
Compression Ribbs..60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*	
Eastern:			
70%	50&17½%	45%	
Central:			
70&5%	55%	45%	
Western and Southern:			
65&10%	50&2½%	40&5%	
So. Western			
65&5%	45&5%	40&2½%	

Terms, 60 days; 2% cash 10 *days. Factory shipments generally delivered.*

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 22@25¢; lighter than 3 lb. to pair.....24@27¢

Cord— Sash—

Braided, Drab.....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 23¢; B, 22¢
Common India.....*lb., 11@11½¢*
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....*lb*...20¢
Cable Laid Russia.....*lb*...21¢
India Hemp, Br'd'd.....*lb*...21¢
India Hemp, Twisted..*lb*.13@14¢
Patent India, Twisted...*lb*...17¢
Pearl Braided, cotton, No. 6, ₱ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ₱ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....₱ lb 40¢
Massachusetts, Drab.....₱ lb 45¢
} 15%
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord .....85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₱ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 8 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....60%
B. Mfg. Co.....40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202. $1.50.....40&7½%
P., S. & W. Co.:
Dixon's.....₱ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$20.00

Ideal .....40@40&5%
Hales .....60&10&5%
Little Giant..... ....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ₱ doz, $24.00.....40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00 .....45&10&10%
$15.00 $18.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater .....₱ doz. $4.00

Tobacco—

All Iron, Cheap..*doz.* $4.25@$4.50
Enterprise .....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18 .....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ₱ doz., $24.00.....25%
Samson, ₱ doz., $34.00.....25%
Iwan's Improved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz. $8.75
Split Handle Post Hole Diggers, ₱ doz., $7.75
Hercules Pattern, ₱ doz.....$10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W.....50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....70@70&5%
Taper and Straight Shank..... 60&10@70%

Drivers, Screw—

Screw Driver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 .....50%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co. Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:		
75&5%	60&10%	45%
Central:		
75&10%	65%	45%
Western and Southern:		
75%	60&5%	40&5%
So Western:		
70&10%	55&7½%	42½%

Terms.—2% for cash. Factory shipments generally delivered.

Note.—Lower prices are made in some sections.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:

	Galv. Steel and Galv. C. I. Standard Gauge	*Copper*
No. 26	50%	
No. 24	45%	
No. 22	40%	
Copper		$0&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to ⅜:	*½ to 2 2&0:*	*Flour.*
Kegs.....*lb.*	5 ¢	5½ ¢	5½ ¢
½ Kegs.....*lb.*	5½ ¢	5¾ ¢	5¾ ¢
¼ Kegs.....*lb.*	5½ ¢	6 ¢	6 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	8 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..10 ¢	10 ¢	8 ¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....60%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined....60%
John Sommer's No Brand, Cedar....60%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands....75&10@80%
Lower Grade...75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....60%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66%
Victor, Header.....65
Champion, Hay.....66%
Champion, Header.....65
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20
Columbia, Manure.....70
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40
W. & C. Potato Digger.....60&10
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&5&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.80
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb. $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....40%
Hemp Rope.....40%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A., E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory....$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.
20&3

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex, Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.80
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 15.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44, 2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48.....60&5%
Folding Door B. B. Swivel No. 138 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Myers' Stayon Hangers.....60%
Extra 10&10% often given.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....℔ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—
Regular list, first qual. 40&2½&—
Second quality.....50&5&—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....25%
Clark Coal, ℔ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No, 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets: *No.*	*1*	*2*	*3*
Hinges with L'f'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:

With Latch.....dos.	*...@$2.00*
Without Latch...dos.	*...@$1.60*

Reversible Self-Closing:

With Latch.....dos.	*...@$1.75*
Without Latch...dos.	*...@$1.35*

Western:

With Latch.....dos.	*$1.75*
Without Latch.....dos.	*$1.15*

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T...50&10%
Extra 10&7½%

Screw Hook and strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
⅜ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

10&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern..... 60&10@60&10&10%
Grub, list Feb. 23, 1899..... 70&10@70&10&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 40&5%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe, ℔ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'ning Shuffle Hoe, ℔ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....30%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ℔ doz. pairs.....$1.25
Dash Rein Holder, ℔ doz. pairs. $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....60%
Wire C. & H. Hooks....75@—%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $8.50.
Cotton.....doz. $1.05@$1.25.
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz.....$1.50
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Turner & Stanton Co., Cup and Shoulder.....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5@ 6¢
3-ply Guaranteed.....ft. 8@ 9¢
4-ply Guaranteed.....ft. 10@11¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons—Sad—

From ¼ to 10.....lb. 3@3½¢
B. B. Sad Irons.....lb. 3¼@3½¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	85	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....doz. 60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...30&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Wilmington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....80@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.50@5.75
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.40
Carriage, Jap., all sizes.....gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....doz. $4.35@4.50
Side Lift, No. 0.....doz. $4.60@4.75
Hinge Globe, No. 0. doz. $4.60@4.75
Other Styles.....40@40&10%

Bull's Eye Police—

3-inch.....$4.25@4.50

Latches—Thumb—

Roggin's Latches, with screw..doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.30
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*2.25*	*2.00*
75 feet	*$2.10*	*1.80*	*1.65*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—

Cabinet Locks.....33⅓%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Iron Patent Sash Cord.....
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.....℔ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				70%
Great American Ball B'r'g, new list.				70%
Quaker City				60%
Pennsylvania				60%
Pennsylvania, Jr., Ball Bearing,				50&10&5%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel, spcl. list,				70&10%
Style D, High Wheel, spcl. list				70%
Philadelphia:				
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list.				40%
Horse				40&5%
Pony				40&5%
36-in. Horse				30&10%
Eagle Horse				30&5%
I. X. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous.....87½@87½&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	....net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	....10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....per lb. 9@10¢

Picture—

	1½	*2*	*2½*	*3*	*in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head.	*..*	*1.10*	*1.10*	*1.10*	*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list*
Square, Blank or Tapped..4.90¢
Hexagon, Blank or Tapped.5.30¢
Square, Bl'k, C., T. R....5.30¢
Hexagon, Bl'k, C., T. & R.6.05¢
Hot Pressed:
Square, Blank.....5.80¢
Hexagon, Blank.....6.30¢
Square, Tapped.....5.40¢
Hexagon, Tapped.....5.90¢

Oakum—

Best.....lb., 6½¢
U. S. Navy.....lb., 6¢
Navy.....lb., 5¢
Plumbers' Spun Oakum..2¾@3¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Can—*Per doz.*

Sprague, Iron Handle....50@35¢
Sprague, Wood Handle....55@40¢
Sardine Scissors.....$1.75@$3.00
Yankee Can and Bottle Opener, ℔ doz., net, $0.75; Little Gem, ℔ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....20@25¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb. 80¢.....25%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4½@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans—Dripping—

Standard List.....65&7½@70%
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.....3@5¢
Per roll
Rosin Sized Sheathing:, 500 sq. ft. Light weight, 25 lbs. to roll 48@58¢
Medium weight, 30 lbs. to roll. 56@70¢
Heavy weight, 40 lbs. to roll. 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$54.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.... $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h..50&10@60%

Parers—Apple—

Goodell Co.:
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
New Lightning.....℔ doz. $7.00
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....℔ doz. $4.00
Little Star.....℔ doz. $5.00
Rocking Table.....℔ doz. $6.20
Reading Hardware Co.:
Advance.....℔ doz. $4.00
Baldwin.....℔ doz. $4.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25

Potato—

Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List.....70&10@70&10&10%
Cronk's Handled Garden Mattock, ℔ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60&10@—%
Extra Heavy, 2-6 in...70&10@—%
Fittings, Standard and Heavy, 75&10@—%

Pipe, Merchant—

	Consumers, Carloads. Steel.		Iron.	
	Blk.	Galv.	Blk.	Galv.
	%	%	%	%
¼ & ⅜ in...	64	48	57	41
½ in.....	66	52	59	41
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class .....77@78%
Second-class .....80@81%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes -
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....⅌ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers -
Button Pliers....75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....30%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers....lb. 9 ¢
¼-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10 ¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (¼ pt.), ⅌ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes, ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr. $9.00
Black Kid Paste, 5 lb can....each. $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ⅌ gr. $5.75.....10%
Dixon's Plumbago.....⅌ lb 8¢
Fireside .....⅌ gr. $2.50
Gem, ⅌ gr. $1.50.....10%
Japanese .....⅌ gr. $3.50
Jet Black.....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ⅌ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.00; gro.$11.00
2 qt. Square..doz.$1.25; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....50&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)...	6.25	7.75
Quarter Keg (6¼ lb bulk).	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ⅌ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ⅌ doz., $12.00..33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00 .....60%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.50	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz....	$0.65	.85	1.20
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@21¢
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel Eagle.....17@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ⅌ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26 Trov..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75¢&5@75¢&10%
Wood Pumps, Tubing, &c....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....5&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....⅌ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher. .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	1	2	3	4	20%
	$5.00	6.00	7.00	8.00	

Cup Leathers—Per 100:

Inch....	2½	3	3½	4	20%
	$5.00	7.00	9.00	12.00	

Punches—
Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 50%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..⅌ ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ⅌ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅌ 100 ft. $3.45
O. N. T., ⅌ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....⅌ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ⅌ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, ⅌ ft., 11¢, 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅌ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ⅌ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ⅌ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....⅌ doz. $3.15
Lawn Queen, 24-tooth....⅌ doz. $3.25
Paragon, 20-tooth.....⅌ doz. $2.70
Paragon, 24-tooth.....⅌ doz. $2.75
Steel Garden, 14-tooth....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, ⅌ doz., No. 42, $36.00; No. 44, $20.00; No. 82, Platina, $25.00. } 40%
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze 25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02904 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%; 986 PN., 2904 N., 974 PN.....25%
5009 PN., 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70@70&10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
Hill's Ringers, Gray Iron, doz..60¢
Hill's Ringers, Malleable Iron.. *doz.*.80¢
Blair's Rings.....*per gro.*$5.00
Blair's Ringers.....*per doz.*75¢
Brown's Rings.....*per gro.*$5.25
Brown's Ringers....*per doz.*75¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Brickerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger:
Pure .....lb., 11½@12¢
Sisal, 7-16 in. diam. and larger:
Pure .....lb., 8¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....lb., 7@7¼¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb., 7@7¼¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed .....lb., 6¼@6¾¢
Pure .....lb., 7¼¢
Cotton Rope:
Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb., 7½@8¢
Thread, No. 2, ¼-in. & up, lb., 7@7½¢

Wire Rope—
Galvanized .....$7½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel .....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws ..30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws ..30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws. 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 40%
National Hand Frames ..... 30&5%
National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 .. 15&10%

Scales—

Family, Turnbull's ....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz., $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz., $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.60
Ship .... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ...30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ...70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80@80&5%
Coach, Gimlet Point, 75&10@75&10&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@..%
Round Head, Iron ..... 85&5@..%
Flat Head, Brass ..... 80&5@..%
Round Head, Brass ..77½&5@..%
Flat Head, Bronze ..... 75&5@..%
Round Head, Bronze. 72½&5@..%
Drive Screws ..... 87½&5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb. $7.25@7.75
No. 3 Clipper, Pol'd Webb .. $7.50@8.00
No. 6 Clipper and Solid Steel, $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ... $9.25@9.75
Nos. 3 and 4 Clipper, Grain .. $9.50@10.00
Solid Steel, No. 6 .... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12, 40&10%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ....40&10%
Snell's Knurled, Cup Pt. ....40&10%
Victor Knurled Cup Pt. ... ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut .... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz $1.50
Mounted Kitchen Sand Stone, ℔ doz $1.50
Natural Grit Carving Knife Hones, ℔ doz $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz $1.50
Quick Edge Pocket Knife Hones, ℔ doz $2.50
} 50%

Skate—

Smith & Hemenway Co., Eureka ..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ℔ doz. $3.00 ..... 15&10%

Shears—

Cast Iron..	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap .... 70@70&10%
Best quality, Nickel .. 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel ... Bld Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ...40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in	$4.25	$5.50
Dixie, 10 x 14 in	4.50	6.00
Dixie, 7 x 10 in	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ℔ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall. D. Handle. $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz $39.00

Sieves, Seamless Metallic

	—Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... doz. $0.90@0.95
Mesh 20, Nested .... doz. $1.00@1.05
Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 40 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list:
Up to and including 20 x 36 in. 50&5%
20 x 40 to 24 x 50 in. 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless. 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ℔ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 49@52¢
1½ x 3 x 28 ..... per pr. 73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ℔ doz $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } List Jan. 5, 1900.
Steel and Iron .. } 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3¼@3¼¢

Steels, Butchers'—

Dick's 30%
Foster Bros.' 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ℔ lb
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
} 33⅓%

India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks. 40%
Hindostan No. 1, R'g'lar. ℔ lb 8¢
Hindostan No. 1, Small .. ℔ lb 10¢
Axe Stones (all kinds) .....
Turkey Oil Stones, Extra, 5 to 8 in. ..... ℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 8¢
} 33⅓%

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S. ℔ gro. $6.00
Extra Indian Pond S.S. ℔ gro. $7.50
No. 1 Indian Pond S.S. ℔ gro. $7.00
No. 2 Indian Pond S.S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Quick Cut Emery.... ℔ gro. $10.00
Pure Corundum,..... ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
Electro (Artificial), ℔ gro., $12.00 ..... 33⅓%
Lightning (Artificial), ℔ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.66
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....30&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ℔ doz.
Superba, Crotch Mahogany....$36.00
Triumph, Fancy Veneers.....$33.00
Parlor Queen, Fig. Rosewood..$30.00
Elite, Hungarian Ash.....$29.00
Am. Queen, Fig. Mahogany....$27.00
Ideal, Bird's-Eye Maple.....$25.00
Grand Rapids, Nickel, $21.00; Japan $22.00
Standard, Nickel, $22.00; Japan.$20.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Crystal, Glass Top.....$36.00
Grand, 17 in. wide.....$36.00
Club, 21 in. wide.....$54.00
Hall, 28 in. wide.....$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...90&40%
American Cut Tacks.....90&40%
Swedes' Cut Tacks.....90&40%
Swedes' Upholsterers'.....90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&40%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50&10%
Hungarian Nails.....80&20%
Finishing Nails.....70%
Trunk and Clout Nails...80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 tens @—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$6.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1036L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....80&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....35%

Ship—

L. & I. J. White.....35%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....75@75&10%
Oneida Community Jump.....50%
Hector .....75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ℔ doz., $13.25..$11.50 doz.
No. 3, Rat, ℔ doz., $6.50... $5.75 doz.
No. 3½, Rat, ℔ doz., $5.25. $4.70 doz.
No. 4, Mouse, ℔ doz., $3.85. $3.00 doz.
No. 5, Mouse, ℔ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ℔ doz....$0.60
Out o' Sight, Rat, ℔ doz..... 1.25
Easy Set, Mouse, ℔ doz..... .35
Easy Set, Rat, ℔ doz..... 1.00
Wood Choker, Rat, ℔ doz. holes. .12
Premier Tin Choker, 5 hole, ℔ doz. traps..... .75

Trowels—

Disston Brick and Pointing... .....25%
Disston Plastering..... .....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks..... ℔ doz. $16.00
Grocery ..... ℔ doz. $15.00
McKinney Trucks.....each, net $10.00
Model Stove Trucks..... ℔ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $79 $89 $99 10&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls.23@25¢
No. 12, ¼ and ½-lb. Balls.21@24¢
No. 18, ¼ and ½-lb. Balls.18@20¢
No. 24, ¼ and ½ -lb. Balls. 17½@19¼¢
No. 36, ¼ and ½-lb. Balls.17@19¢
Chalk Line, Cotton ½-lb. Balls .....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@25¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....14½@15½¢
American 3-Ply Hemp, 1-lb. Balls .....15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....13½@14½¢
Mason Line, Linen, ½-lb. Bls.17¢
No. 26½ Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel.....25%
Star, Solid Jaw.....40%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Rock Island 25%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.: Reed 25%
Star 40%
Massey Vise Co.: Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe: 97 Series, 60%; 137 Series, 60&5%; No. 870, 40%.
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$3.55
Cable Cross, family size, stationary protector.....$3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe.....$2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.95

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ⅛ 1 1¼ 1¼ Inch. 9¢. 10¢. 11¢. 14¢. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.90 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co.....30&2

Sash—

Per net ton, f.o.b. factory:
Eastern District...$25.00@$28.00
Southern Territory.$22.00@$24.50
Western and Central Districts .....$22.50@$23.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72&10&7½%
10 to 18.....72½&10&10%
19 to 26.....75&10&10&2½%
27 to 36.....77½&7½%
Galvanized:
6 to 9.....72½&10%
10 to 14.....72½&10&5%
15 to 16.....72½&10&5%
17 to 18.....72½%
19 to 26.....70&5&2½%
27 to 36.....65&10&10%
Coppered:
6 to 9.....65&10&10%
10 to 14.....70&10&5%
15 to 18.....65&10&10&10%
19 to 26.....70&5&2½%
27 to 36.....72½&10&2½%
Tinned:
6 to 18.....67&10&10%
Brass .....17¼¢ lb., base
Copper .....32¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $2.10@$2.40
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&25@—%
Brass Wire Goods....90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 80%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10&5%
Eagle 70%
Gem Pocket.....50%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases.....50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches.....50%
Vulcan and Agrippa Chain.....50%
Whitaker Machinists':
Case lots.....50&10%
Less than case lots.....50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....85&10&10%

Zinc— (*Cask lots at mill.*)

Sheet.....per 100 lb. $7.00